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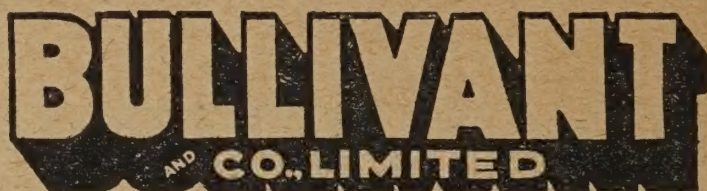
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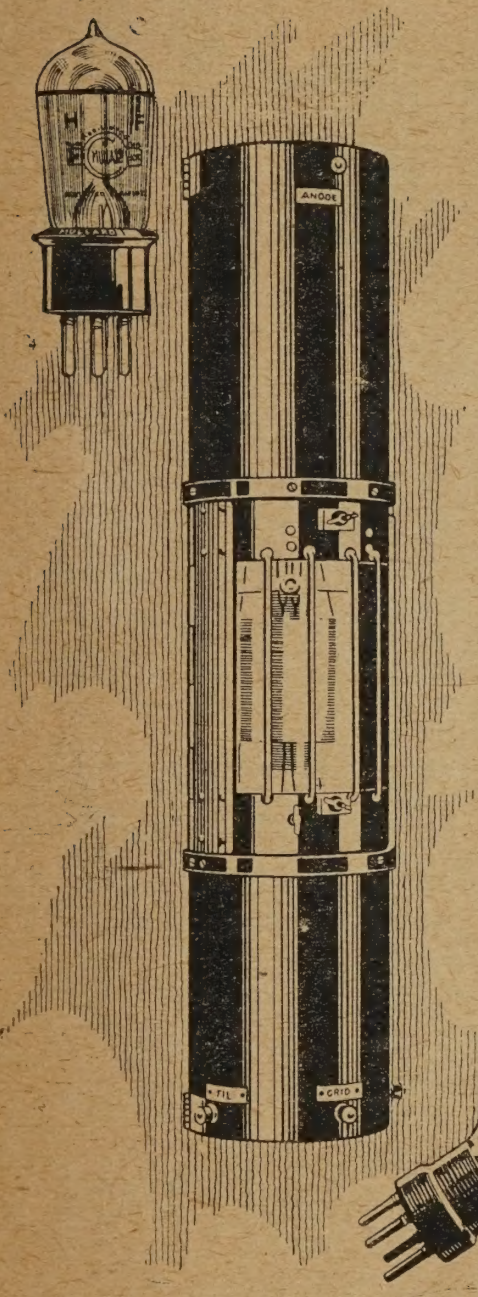
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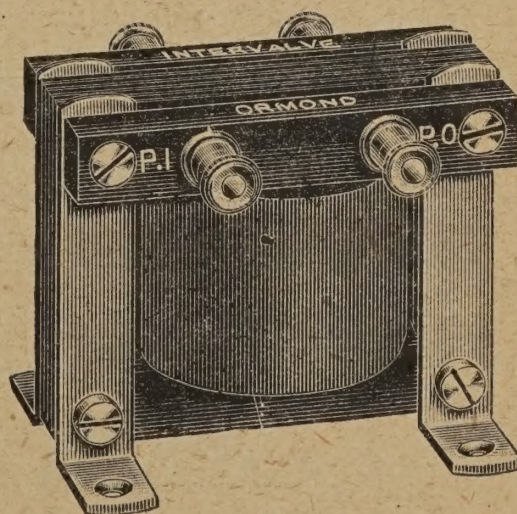
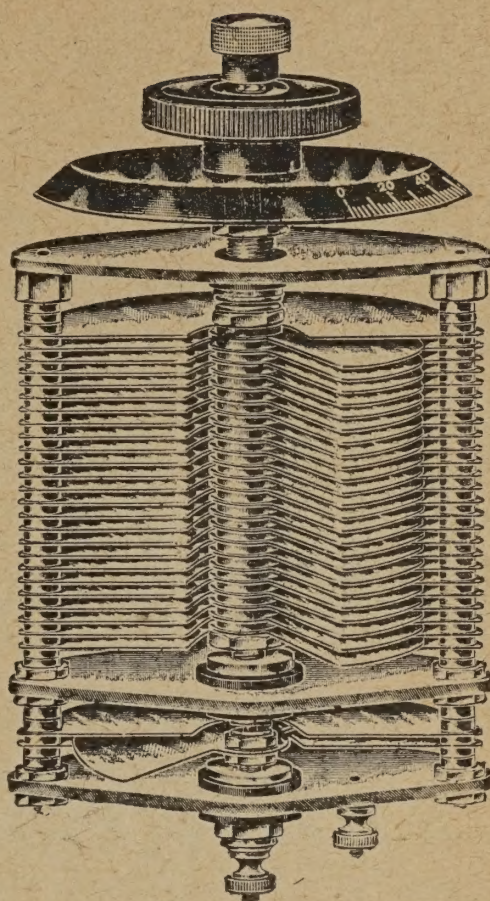
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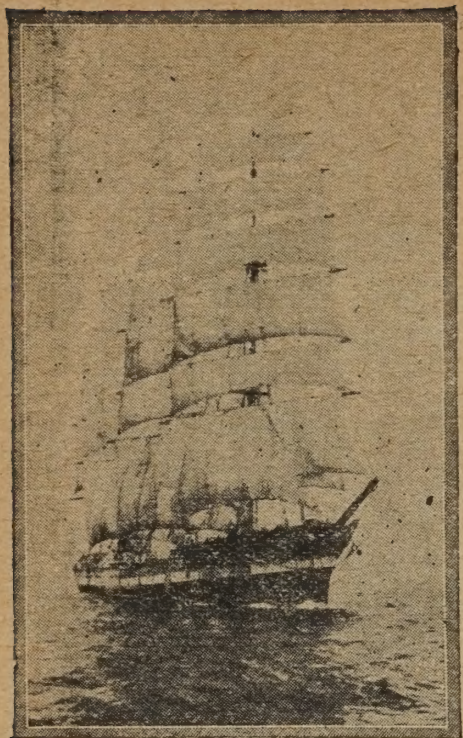
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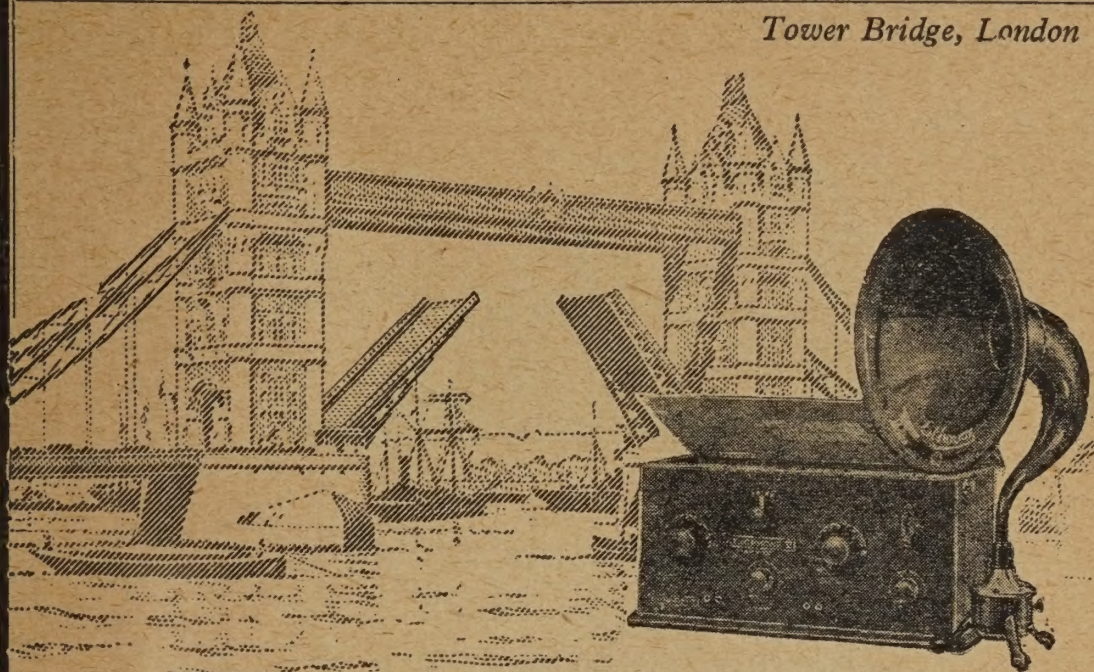
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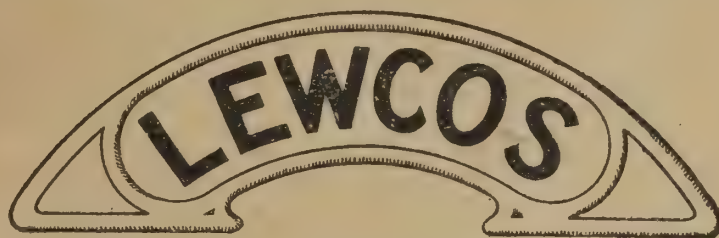
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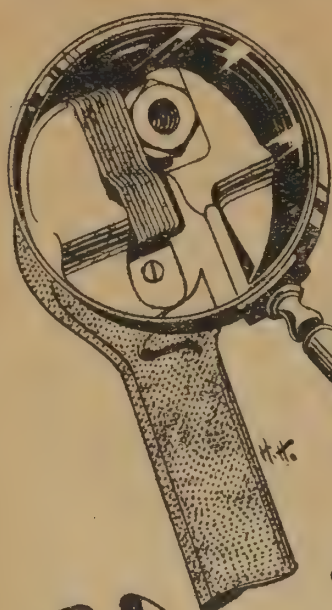
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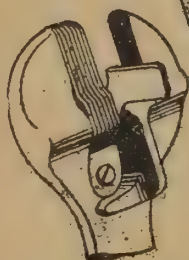
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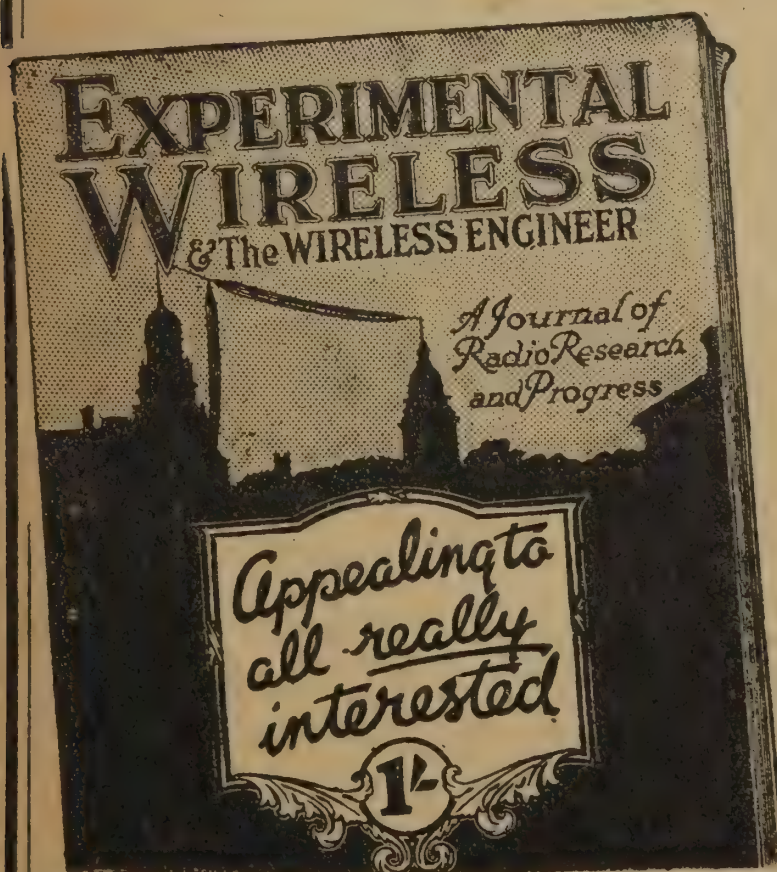
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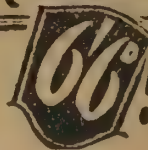
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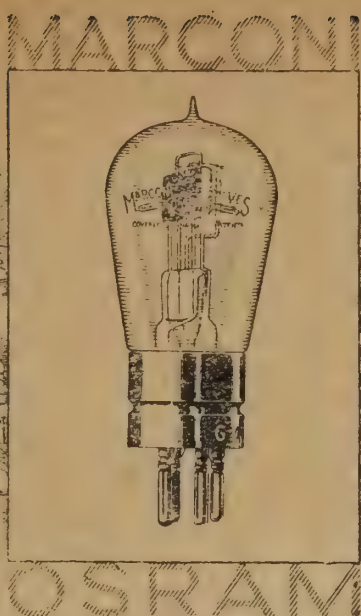
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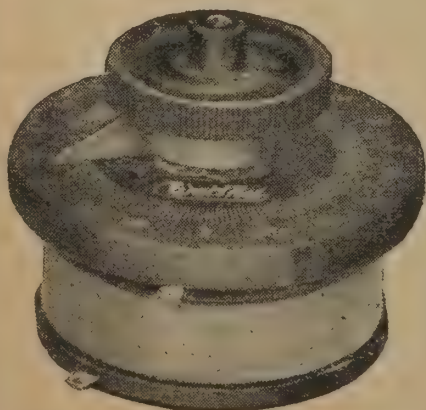
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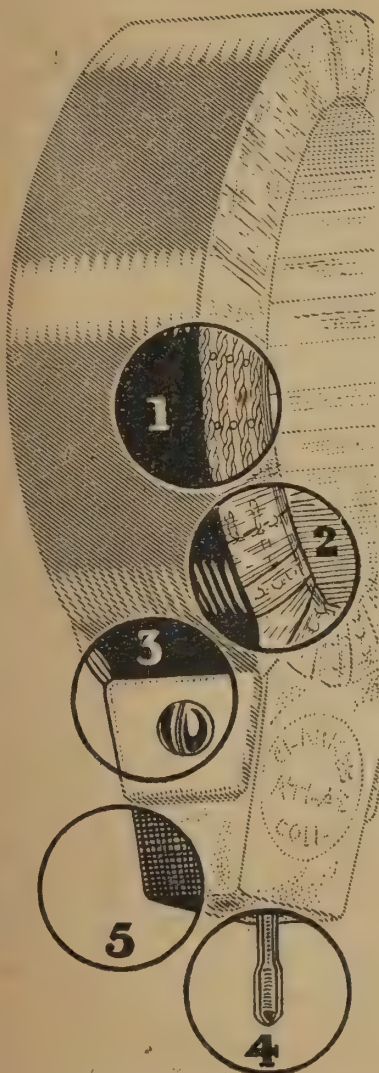
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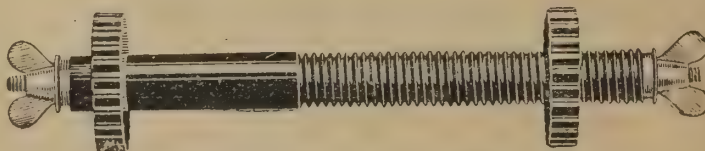
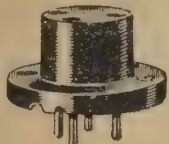


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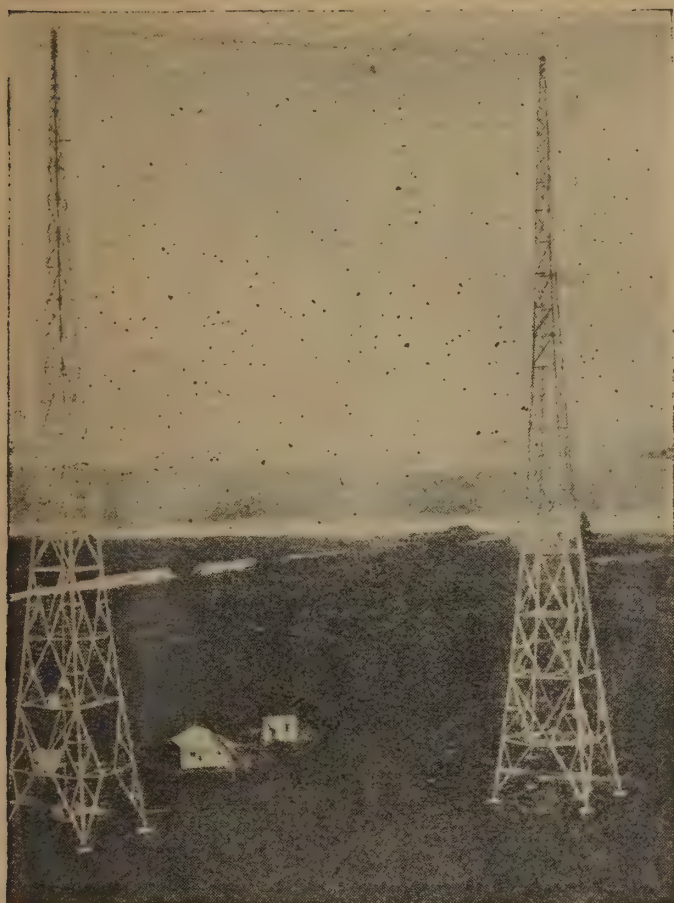
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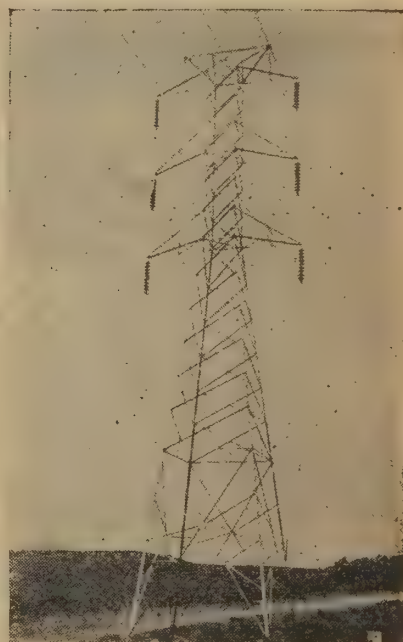
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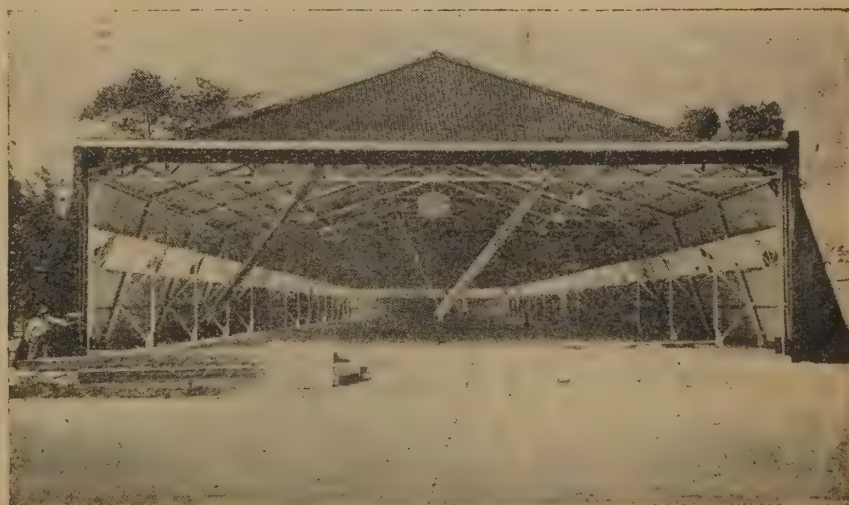
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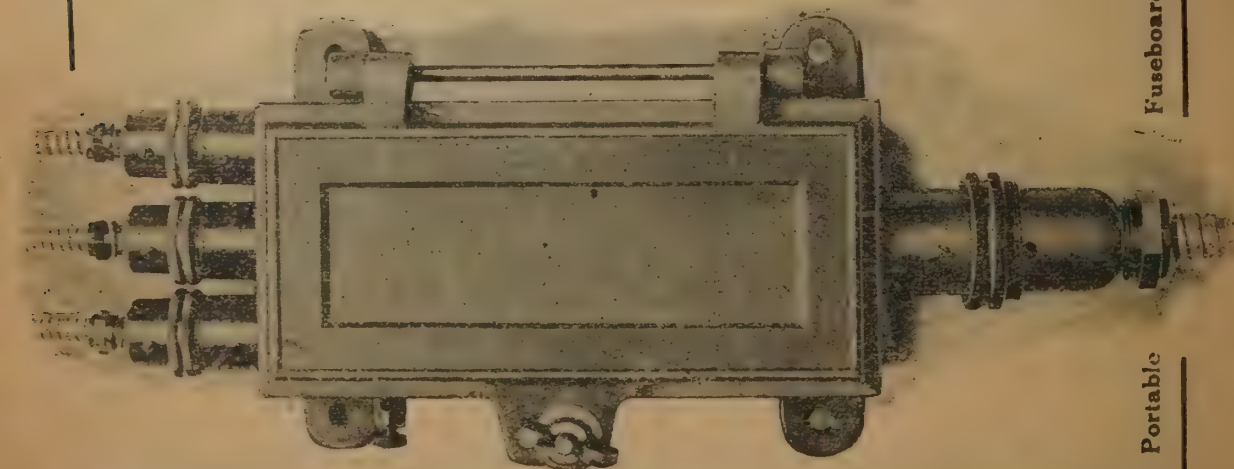
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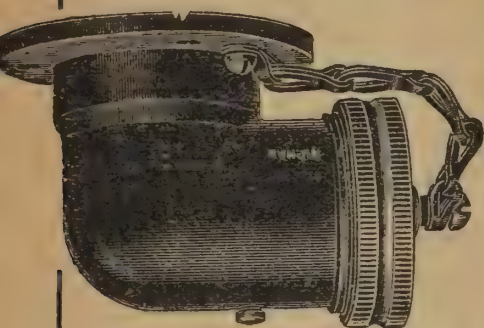
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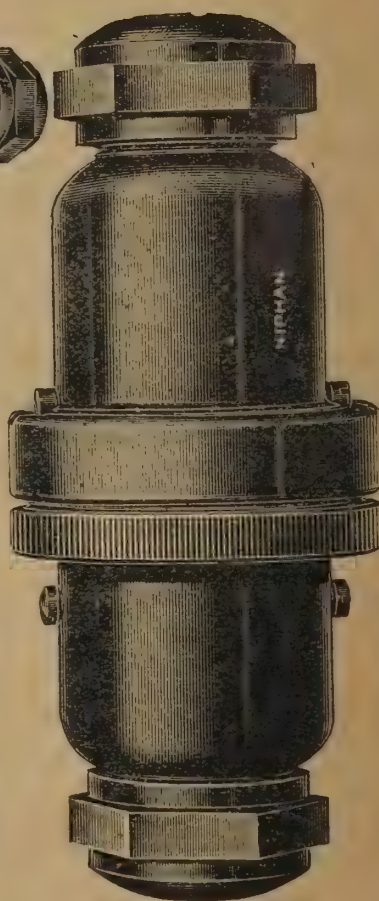
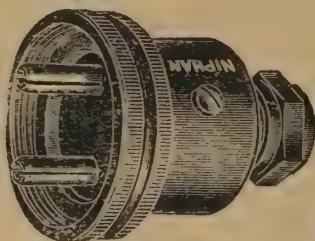


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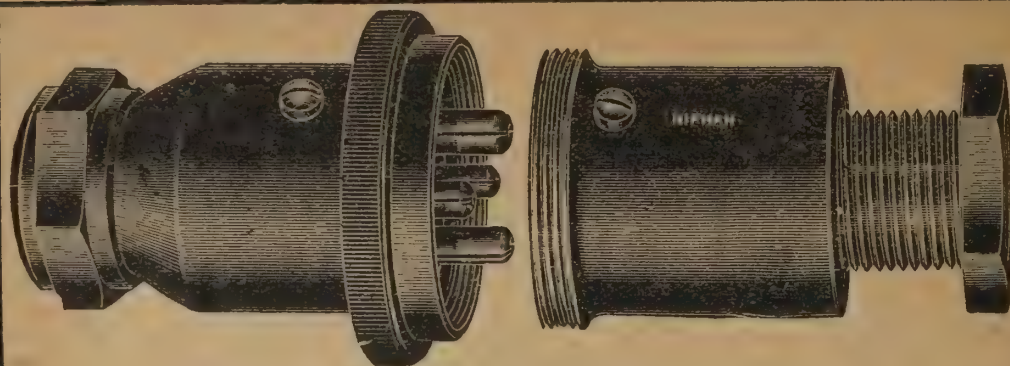
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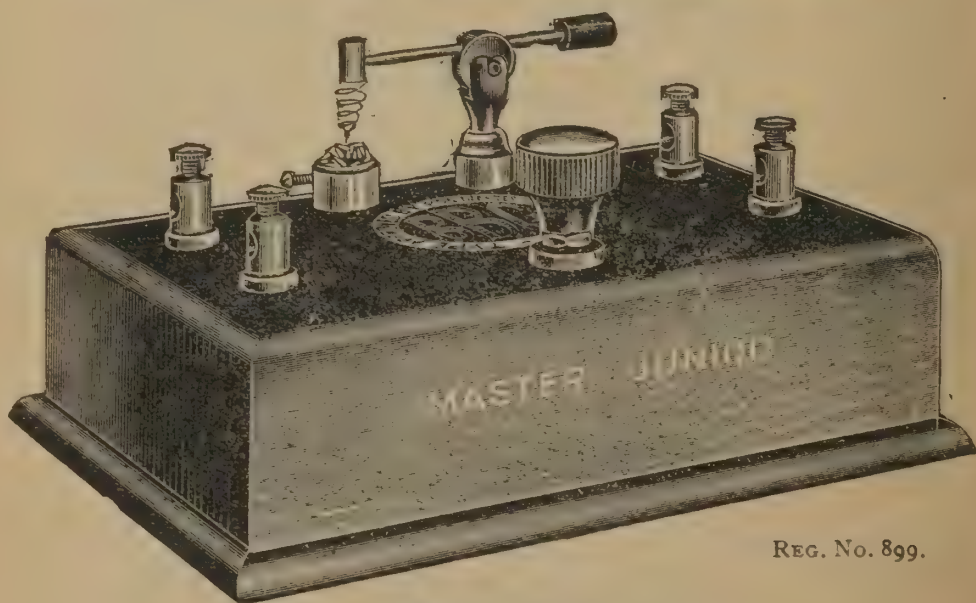
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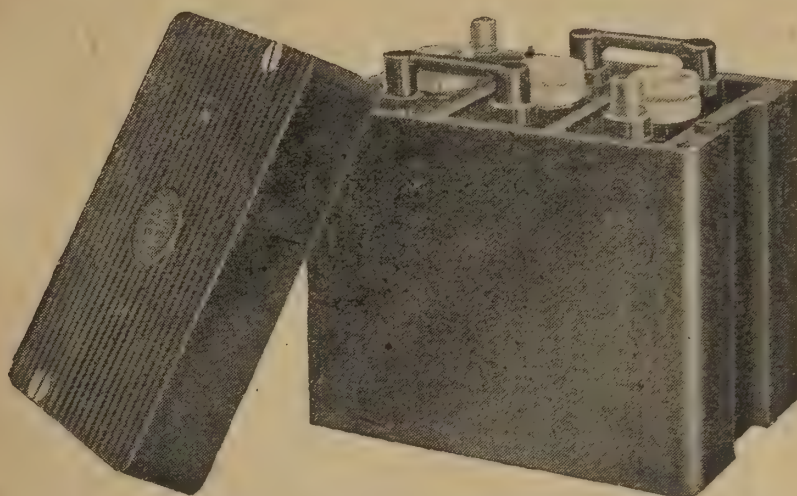
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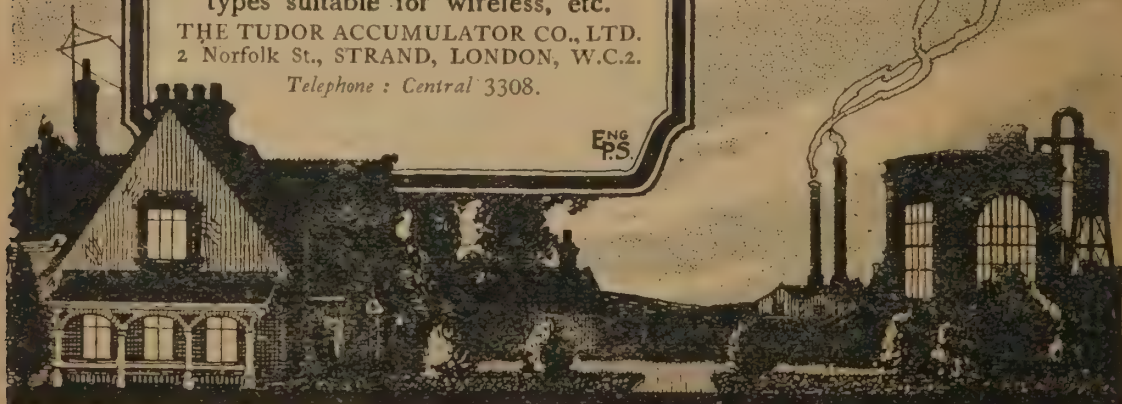
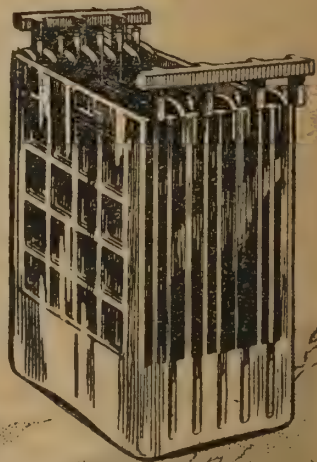
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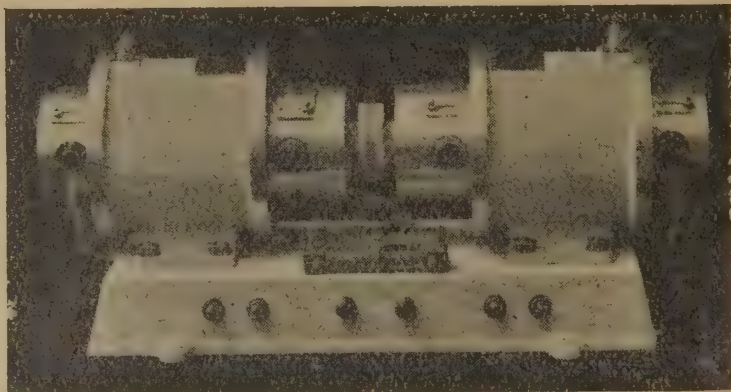
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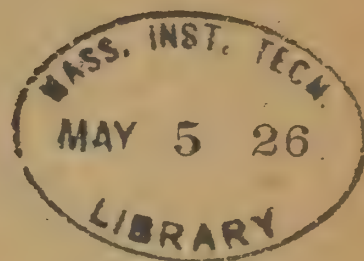
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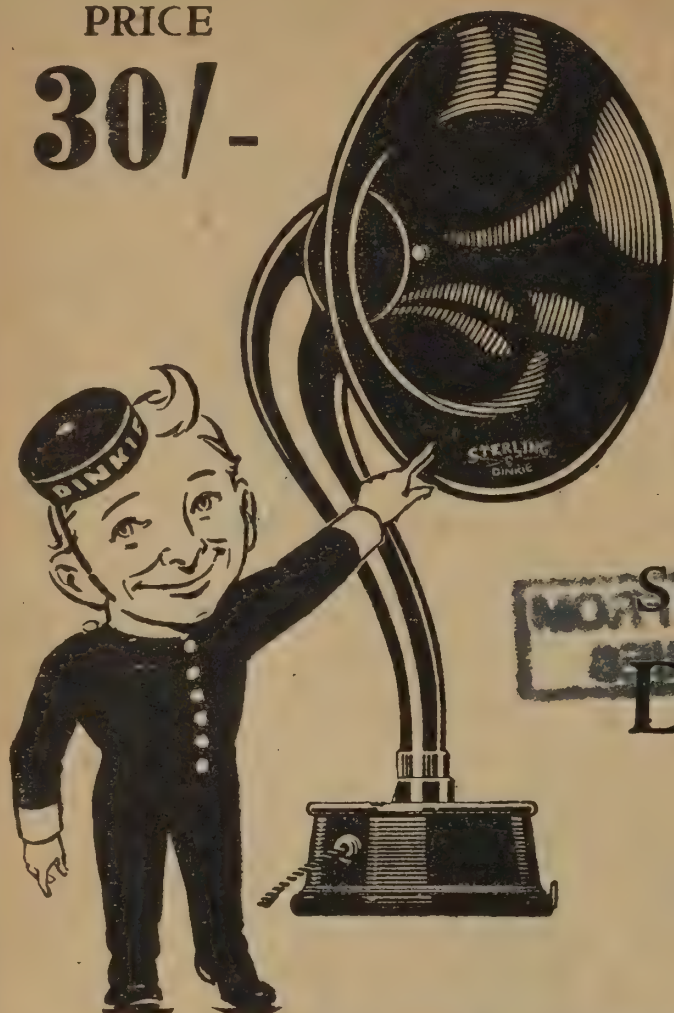


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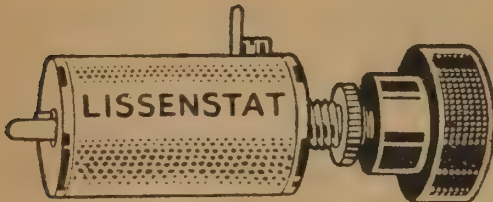
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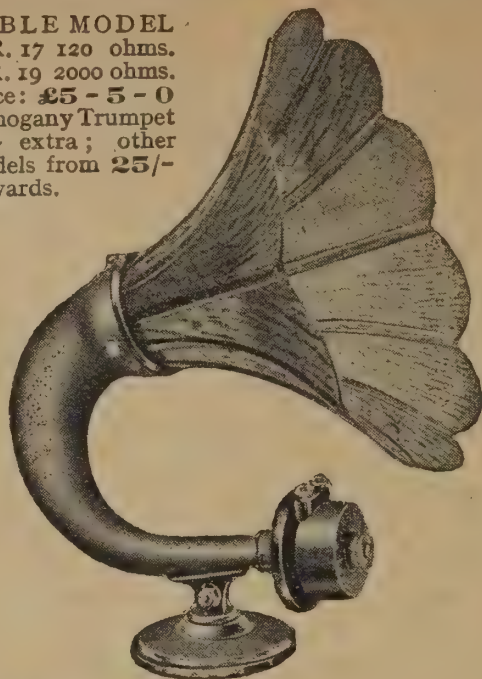
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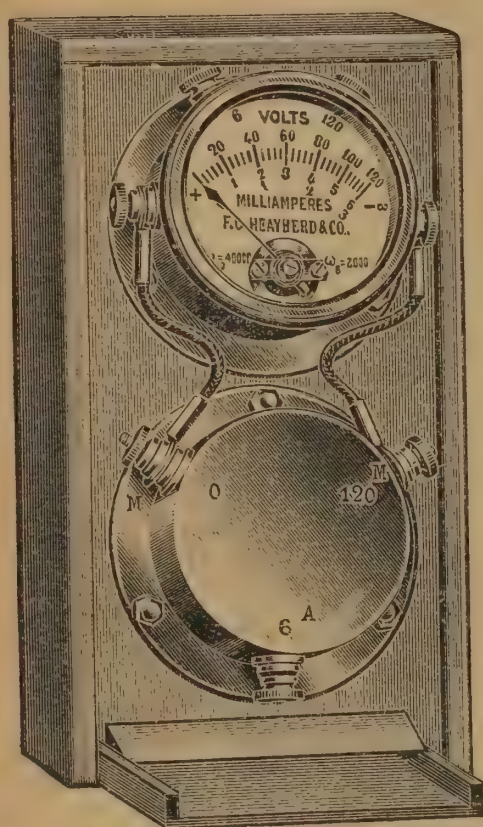
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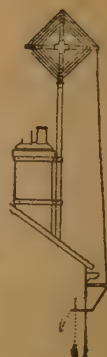
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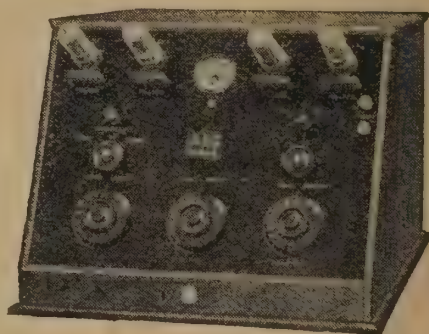
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PREFACE

THE gratifying reception accorded to the "YEAR BOOK" in the less bulky form instituted last year has encouraged us to retain the same general features in the present edition.

The task of compiling information and discriminating between the essential and the superfluous becomes more difficult each year, and we frankly envy our predecessors in the days when stations were comparatively few in number, wavelengths, when once allotted, remained constant, Direction-Finding, Meteorological Transmissions, Press Messages and Time Signals were almost unknown and Broadcasting not even thought of. At the same time the Editor's work had not then the varied interest now given to it by the ever increasing growth of wireless telegraphy and telephony, which keeps us constantly on the alert for fresh data.

The work entailed in keeping the list of Land Stations up-to-date is, in itself, considerable and may reasonably be compared with an attempt to record the colours of a rapidly-changing kaleidoscope. We rely mainly upon the official information contained in the International List of Radiotelegraphic stations, the Admiralty List of Wireless Signals, the List of Commercial and Government Radio Stations of the United States, and their respective monthly or weekly supplements. These supplements by the end of the year, usually exceed in bulk the parent publication and each one received entails numerous corrections and alterations to our records. In many cases the information given by these different authorities does not entirely agree—this is probably due to the date upon which it reached them—and we have to exercise considerable discrimination in deciding which of the various sources is most likely to be correct. For this reason we cordially welcome any direct information from far-distant countries.

It is often difficult to realise the need for the almost infinitesimal changes of wavelength in some of the American Stations as, for example, when that of Washington NAA was altered from 5,950 to 5,949 metres. (This implies an even greater degree of accuracy than the calibrated waves transmitted from Lyons and the Eiffel Tower.) We look forward hopefully to a wireless millennium when wavelengths and call signs will have settled down to some degree of finality and these irritating small changes will cease.

The record of Development of Wireless Telegraphy, which has again been compiled by Mr. W. H. Nottage, gives a general account of the progress made in all parts of the world.

The cosmopolitan nature of wireless makes it impracticable to consider each country individually; we have endeavoured, however, in the brief introductions to their respective Laws and Regulations to record special items of interest. The Laws and Regulations themselves are generally considered a necessary but tedious part of the book. It is interesting, nevertheless, to note how national characteristics often crop up. The regulations of Germany, for example, lay great stress upon the penalties consequent upon their infraction, while Belgium is almost motherly in her solicitude for the welfare of all concerned.

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Matched Tone

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Radio Headphones

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PREFACE

One of the chief difficulties which confront the Editor of a publication of this kind is to preserve a sense of consistency throughout the book. It is a popular fallacy that he is omniscient, but in actual practice he has to collect information from innumerable sources and in divers languages, using every means in his power to ensure that it shall be accurate and the best obtainable. It is often hard to get really reliable facts from some foreign countries, and it is generally found that destructive criticism is most freely lavished by those who are most backward in supplying the much-needed particulars.

To those who have so kindly rendered us the assistance so necessary in the preparation of the "YEAR BOOK," we offer our most grateful thanks, especially to the Postal Authorities, Consular Offices, Wireless Engineers and other foreign and Colonial officials who have revised the information already published and furnished us with fresh particulars regarding their respective countries. We also express our appreciation of the valuable help afforded by the Secretary's Department of the General Post Office in reading and correcting the proof sheets of the laws and regulations controlling Wireless Telegraphy in Great Britain, and by the Air Ministry in furnishing us with the latest particulars of French Meteorological Transmission.

With regard to our special contributors, the varied and extensive information contained in the "Scientific Signal" section has again been carefully compiled by Mr. W. G. W. Mitchell; Dr. R. L. Smith-Rose has written the introduction to the Direction-Finding section and also contributed an interesting article on "Some Recent Work at the N.P.L." The tabular matter relating to Direction-Finding has been undertaken by Mr. R. Keen. The Aviation Section has received the special care of Mr. Duncan Sinclair, who prefaces it with an able and instructive article on "Civil Flying in 1924." Mr. W. H. Nottage has contributed a descriptive summary of the principal valve Patents published in 1924, and Mr. J. Malin has compiled an exhaustive index of British Wireless Patents issued during the past year. The Definitions of Technical Terms have been carefully revised by Mr. R. A. Ramsay, while Mr. W. B. Cole and Mr. H. Kirby, the head of the Marconi Co's Translation Department, have combined their engineering and linguistic knowledge in the production of the Technical vocabulary in five languages.

Mr. W. James has compiled a quantity of tables and other data of use to the practical experimenter, keeping in mind the fact that each individual investigator probably has his own favourite tables for reference.

Special articles on technical subjects are contributed by Dr. A. N. Goldsmith, Capt. H. J. Round, Mr. T. L. Eckersley, and Capt. A. G. D. West, all recognised authorities on their respective subjects.

The maps of the Wireless Stations of the World have been carefully revised and brought up-to-date and the general information contained in this volume is believed to be as complete and accurate as possible, considering the ever-increasing and rapidly-changing progress in all branches of Wireless Telegraphy and Telephony.

THE EDITOR.

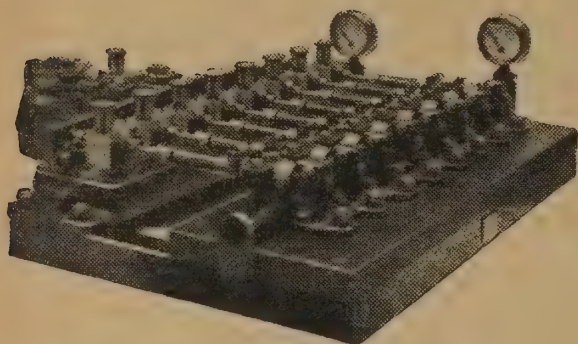
Dorset House.

Tudor Street, London, E.C.4.

1925

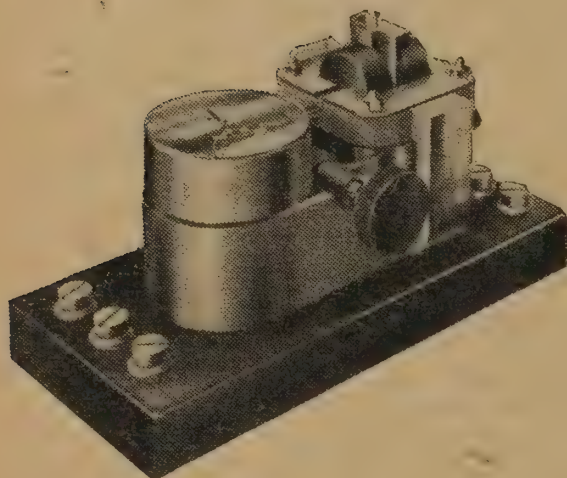
T H E H O U S E O F C R E E D

HIGH SPEED WIRELESS APPARATUS



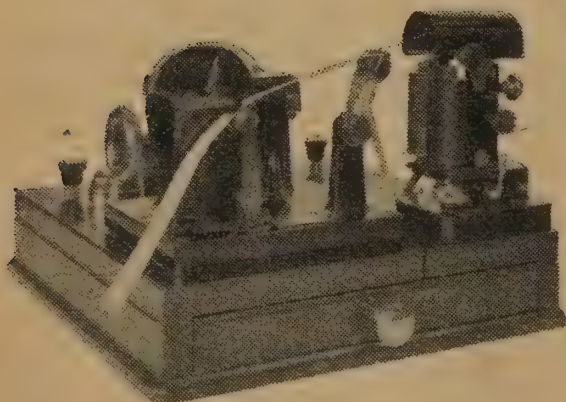
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1925 CALENDAR 1925

JANUARY	FEBRUARY	MARCH
S .. — 4 11 18 25	S .. — 1 8 15 22	S .. 1 8 15 22 29
M .. — 5 12 19 26	M .. — 2 9 16 23	M .. 2 9 16 23 30
T .. — 6 13 20 27	T .. — 3 10 17 24	T .. 3 10 17 24 31
W .. — 7 14 21 28	W .. — 4 11 18 25	W .. 4 11 18 25 —
T .. 1 8 15 22 29	T .. — 5 12 19 26	T .. 5 12 19 26 —
F .. 2 9 16 23 30	F .. — 6 13 20 27	F .. 6 13 20 27
S .. 3 10 17 24 31	S .. — 7 14 21 28	S .. 7 14 21 28 —
APRIL	MAY	JUNE
S .. — 5 12 19 26	S .. — 3 10 17 24 31	S .. — 7 14 21 28
M .. — 6 13 20 27	M .. — 4 11 18 25 —	M .. 1 8 15 22 29
T .. — 7 14 21 28	T .. — 5 12 19 26 —	T .. 2 9 16 23 30
W .. 1 8 15 22 29	W .. — 6 13 20 27 —	W .. 3 10 17 24
T .. 2 9 16 23 30	T .. — 7 14 21 28 —	T .. 4 11 18 25
F .. 3 10 17 24 —	F .. 1 8 15 22 29 —	F .. 5 12 19 26
S .. 4 11 18 25 —	S .. 2 9 16 23 30 —	S .. 6 13 20 27 —
JULY	AUGUST	SEPTEMBER
S .. — 5 12 19 26	S .. — 2 9 16 23 30	S .. — 6 13 20 27
M .. — 6 13 20 27	M .. — 3 10 17 24 31	M .. — 7 14 21 28
T .. — 7 14 21 28	T .. — 4 11 18 25 —	T .. 1 8 15 22 29
W .. 1 8 15 22 29	W .. — 5 12 19 26 —	W .. 2 9 16 23 30
T .. 2 9 16 23 30	T .. — 6 13 20 27 —	T .. 3 10 17 24 —
F .. 3 10 17 24 31	F .. — 7 14 21 28 —	F .. 4 11 18 25 —
S .. 4 11 18 25 —	S .. 1 8 15 22 29 —	S .. 5 12 19 26 —
OCTOBER	NOVEMBER	DECEMBER
S .. — 4 11 18 25	S .. 1 8 15 22 29	S .. — 6 13 20 27
M .. — 5 12 19 26	M .. 2 9 16 23 30	M .. — 7 14 21 28
T .. — 6 13 20 27	T .. 3 10 17 24 —	T .. 1 8 15 22 29
W .. — 7 14 21 28	W .. 4 11 18 25 —	W .. 2 9 16 23 30
T .. 1 8 15 22 29	T .. 5 12 19 26 —	T .. 3 10 17 24 31
F .. 2 9 16 23 30	F .. 6 13 20 27 —	F .. 4 11 18 25 —
S .. 3 10 17 24 31	S .. 7 14 21 28 —	S .. 5 12 19 26 —

NOTES FOR YEAR 1925

New Year's Day (Thursday) ..	January 1st	King's Birthday	June 3rd
Good Friday	April 10th	Prince of Wales' Birthday ..	June 23rd
Easter Day	April 12th	Bank Holiday	August 3rd
St. George's Day	April 23rd	Armistice Day	November 11th
King's Accession	May 6th	St. Andrew's Day	November 30th
Empire Day	May 24th	Queen Alexandra's Birthday ..	December 1st
Queen's Birthday	May 26th	Christmas Day (Friday) ..	December 25th
Whit Sunday	May 31st		

1924 CALENDAR 1924

JANUARY	FEBRUARY	MARCH	APRIL
S .. — 6 13 20 27 M .. — 7 14 21 28 T .. 1 8 15 22 29 W .. 2 9 16 23 30 T .. 3 10 17 24 31 F .. 4 11 18 25 — S .. 5 12 19 26 —	S .. — 3 10 17 24 M .. — 4 11 18 25 T .. — 5 12 19 26 W .. — 6 13 20 27 T .. — 7 14 21 28 F .. 1 8 15 22 29 S .. 2 9 16 23 —	S — 2 9 16 23 30 M — 3 10 17 24 31 T — 4 11 18 25 — W — 5 12 19 26 — T — 6 13 20 27 — F — 7 14 21 28 — S 1 8 15 22 29 —	S .. — 6 13 20 27 M .. — 7 14 21 28 T .. 1 8 15 22 29 W .. 2 9 16 23 30 T .. 3 10 17 24 — F .. 4 11 18 25 — S .. 5 12 19 26 —
MAY	JUNE	JULY	AUGUST
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1926 CALENDAR 1926

JANUARY	FEBRUARY	MARCH	APRIL
S — 3 10 17 24 31 M — 4 11 18 25 — T — 5 12 19 26 — W — 6 13 20 27 — T — 7 14 21 28 — F 1 8 15 22 29 — S 2 9 16 23 30 —	S .. — 7 14 21 28 M .. 1 8 15 22 — T .. 2 9 16 23 — W .. 3 10 17 24 — T .. 4 11 18 25 — F .. 5 12 19 26 — S .. 6 13 20 27 —	S .. — 7 14 21 28 M .. 1 8 15 22 29 T .. 2 9 16 23 30 W .. 3 10 17 24 31 T .. 4 11 18 25 — F .. 5 12 19 26 — S .. 6 13 20 27 —	S .. — 4 11 18 25 M .. — 5 12 19 26 T .. — 6 13 20 27 W .. — 7 14 21 28 T .. 1 8 15 22 29 F .. 2 9 16 23 30 S .. 3 10 17 24 —
MAY	JUNE	JULY	AUGUST
S — 2 9 16 23 30 M — 3 10 17 24 31 T — 4 11 18 25 — W — 5 12 19 26 — T — 6 13 20 27 — F — 7 14 21 28 — S 1 8 15 22 29 —	S .. — 6 13 20 27 M .. — 7 14 21 28 T .. 1 8 15 22 29 W .. 2 9 16 23 30 T .. 3 10 17 24 — F .. 4 11 18 25 — S .. 5 12 19 26 —	S .. — 4 11 18 25 M .. — 5 12 19 26 T .. — 6 13 20 27 W .. — 7 14 21 28 T .. 1 8 15 22 29 F .. 2 9 16 23 30 S .. 3 10 17 24 31	S .. 1 8 15 22 29 M .. 2 9 16 23 30 T .. 3 10 17 24 31 W .. 4 11 18 25 — T .. 5 12 19 26 — F .. 6 13 20 27 — S .. 7 14 21 28 —
SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
S .. — 5 12 19 26 M .. — 6 13 20 27 T .. — 7 14 21 28 W .. 1 8 15 22 29 T .. 2 9 16 23 30 F .. 3 10 17 24 — S .. 4 11 18 25 —	S — 3 10 17 24 31 M — 4 11 18 25 — T — 5 12 19 26 — W — 6 13 20 27 — T — 7 14 21 28 — F 1 8 15 22 29 — S 2 9 16 23 30 —	S .. — 7 14 21 28 M .. 1 8 15 22 29 T .. 2 9 16 23 30 W .. 3 10 17 24 — T .. 4 11 18 25 — F .. 5 12 19 26 — S .. 6 13 20 27 —	S .. — 5 12 19 26 M .. — 6 13 20 27 T .. — 7 14 21 28 W .. 1 8 15 22 29 T .. 2 9 16 23 30 F .. 3 10 17 24 31 S .. 4 11 18 25 —

RECORD OF THE DEVELOPMENT OF WIRELESS TELEGRAPHY AND TELEPHONY, AND INTERESTING ITEMS IN CONNECTION THEREWITH

By W. H. NOTTAGE, B.Sc., A.M.I.E.E., F.Inst.P.

The record below is intended to constitute a résumé, arranged in chronological order, of the outstanding events in wireless telegraphy from year to year.

This is a feature which has figured in the YEAR BOOK from its initiation in 1913. The record of the earlier years has now been consolidated under appropriate headings, while that for the last few years remains under annual headings. The record for the past year will be found in an extended form at the end of this section.

HISTORICAL SURVEY.

Prelude.

In 1840 Joseph Henry produced high frequency oscillations by the discharge of a condenser, and in 1853 Lord Kelvin in a paper, "On Transient Electric Currents," deduced mathematically the conditions necessary for electrical oscillations in a circuit, and showed that if the resistance was negligible the frequency was inversely proportional to the geometric mean of the capacity and inductance. In 1873 James Clerk Maxwell published his great work, "Electricity and Magnetism," wherein he showed mathematically that an electrical oscillation in a circuit would give rise to an electromagnetic disturbance, which would travel away as a free wave with a finite velocity. He also postulated that light was such an electromagnetic wave.

In 1887 Heinrich Rudolph Hertz produced Maxwell's electromagnetic waves, and was able to measure their length and velocity and to show that they followed the ordinary laws of interference, refraction, and polarisation. In 1892 Edouard Branly discovered that a coherer, similar to the tube of filings which had been used by David Hughes some 13 years earlier, was very sensitive to electromagnetic waves. In 1894 Sir Oliver Lodge repeated some of the experiments of Hertz with improved apparatus, including coherers instead of the minute spark gaps used by Hertz.

Plain Aerial.

In 1896 Guglielmo Marconi took out the first patent for Hertzian Wave Telegraphy (No. 12039 of 1896), according to which, besides many minor improvements in the apparatus, one end of the Hertzian dumb-bell oscillator was buried in the earth, and the other end was elevated into the air; and with this apparatus he succeeded in communicating nearly two miles. In 1897 Sir Oliver Lodge took out a patent for Syntonic Wireless Telegraphy, according to which, by sacrificing some of the radiating properties of the Marconi aerial, he obtained more prolonged oscillations and better selectivity.

In 1898 Wireless Telegraphy found its first practical use in connecting the East Goodwin lightship with the shore, while in the following year communication was established across the English Channel, a distance of 85 miles was attained between two ships at sea, and Wireless Telegraphy was first used for military purposes in the South African War.

Coupled Circuits.

In 1900 Marconi patented coupled circuits, which enabled more energy to be transmitted and greater selectivity to be obtained. In 1901 the five principal islands of the Hawaiian group were connected up by Wireless telegraphy, and at the end of the year signals were received across the Atlantic in St. John, Newfoundland, from Poldhu, Cornwall—a distance of 1,800 miles. Early in 1902 messages were received at more than 1,500 miles, and signals up to a distance of more than 2,000 miles from shore to ship, while at the end of the year the first wireless message, as distinct from mere signals, was transmitted across the Atlantic. This year also saw the introduction of the Marconi magnetic detector.

In 1903 V. Poulsen, improving on the work done by W. Duddell three years earlier, introduced the arc generator of continuous oscillations.

New Detectors.

In 1904 J. A. Fleming, developing the so-called Edison effect which had been known since 1883, produced the thermionic valve. In 1905 Marconi introduced directional aerials. In 1906 H. H. C. Dunwoody discovered that carborundum crystals, and G. W. Picard that silicon crystals, could be used as wireless detectors; and R. A. Fessenden invented heterodyne reception. In 1907 Lee de Forest, who had the previous year put a third electrode into the Fleming valve, introduced the grid between the filament and the plate in his "Audion"; and in the same year E. Bellini and A. Tosi produced the Radiogoniometer, or Wireless Direction Finder. In 1908 Max Wien invented the quenched spark. In 1909 R. Goldschmidt designed his machine for generating continuous oscillations.

In 1910 messages were received on a ship at sea at a distance of 4,000 miles by day, and 6,735 miles by night, from Clifden. In 1911 R. von Lieben showed that the three electrode thermionic tube or triode could be used as a proportional relay. In 1912 the "Titanic" sank after striking an iceberg, the lives of more than 700 passengers being saved by her wireless call for assistance.

Telephony.

In 1913 A. Meissner produced continuous oscillations by the reaction of a triode upon itself, and C. S. Franklin utilised the same principle for the elimination of the losses in receiving circuits. In 1914 I. Langmuir produced really hard thermionic tubes, and entirely eliminated ionisation therein.

Later in the year began the Great War, which temporarily suspended all commercial circles, and left little to chronicle during its continuance. In 1915 a wireless telephone message was sent across the Atlantic from Arlington to the Eiffel Tower. In 1916 the determination of the difference in longitude between Paris and Washington with the aid of wireless telegraphy, which had been in progress since 1913, was completed, and the result found with a probable accuracy of the order of 0.01 second of time.

With the cessation of the war in 1918 it became known that, although there had been no outstanding discoveries in wireless telegraphy, a steady development had taken place, and, in particular, that the triode had become of the first importance, both as a receiving amplifier and as a generator of continuous oscillations, which had brought wireless telephony into the practical field. Later in the year messages transmitted from Carnarvon, Wales, were received in Sydney, Australia, a distance of 12,000 miles. In 1919 wireless rendered great assistance to the transatlantic flights of the American aeroplane and the British dirigible.

During 1920 the principal events includes the completion of the Lafayette radio station at Bordeaux, the construction of which was commenced during the war by the United States Navy.

Tests were successfully carried out in August of that year, and the station is now carrying on a commercial service.

The high power station at Sayville, which was closed by the United States authorities during the war, was reopened for traffic in April of this year, and a new station at Christiania was opened on January 10th for European traffic only, the Stavanger station being reserved for traffic with the United States.

A number of Direction Finding stations, both in this and other countries, which were originally put up by Government Departments for wartime use, were also made available for merchant service purposes, and have given valuable aid in navigation in difficult waters.

In order to relieve the congestion on the internal telegraph network, the German Government erected a number of medium power radio stations in the important industrial centres of the country. The majority of the pre-war Press, Time Signals, and Meteorological Services were re-established in most countries. A novelty in this direction was the establishment of an astronomical service from the Nauen Station to give information on important astronomical events to all neighbouring observatories, so that observations on outbursts of novæ and similar phenomena could be taken in hand without delay. The British Air Ministry established a comprehensive scheme of meteorological bulletins, which are transmitted both from their own station and from the Aberdeen Wireless Station several times during the twenty-four hours. These messages give the latest information about flying conditions over the British Isles and neighbouring countries.

The most noticeable improvements in commercial apparatus have been those of wireless telephonic apparatus carried out by Marconi's Wireless Telegraph Company at Chelmsford. On a number of occasions during the year transmissions were carried out from that station using as much as 15 kW., and regular concert programmes were transmitted. These transmissions were picked up as far away as St. John's, Newfoundland, a range of 2,673 miles, while ships 1,000 miles at sea also overheard the programmes. The successful linking up of wireless telephonic apparatus with the land line telephones was accomplished, and on August 19th, a successful connection was established between a subscriber's instrument in London and an aeroplane in flight on its way to Paris. Regular wireless telephonic transmissions have also been carried on from a Dutch Wireless Station.

The Government of India formed an Indian Wireless Telegraph Board, with a view to extending and reorganising its existing telegraph system, in order to meet the strategic, political and commercial requirements of the Empire.

The Department of Scientific and Industrial Research established four sub-committees to assist the Radio Research Board. These were to deal respectively with the following branches of radio research : (a) the propagation of wireless waves ; (b) atmospheric ; (c) directional wireless ; (d) thermionic valves.

Certain modifications were made in the rules and regulations governing wireless telegraphy in the British Mercantile Marine. As from September 1st, 1920, automatic call apparatus may be installed subject to the approval of the Board of Trade. For voyages other than coastwise ones exceeding 48 hours from port to port, any vessel carrying 200 passengers or more must carry three operators. For voyages exceeding eight hours, but less than 48 hours from port to port, two operators must be carried. Regulations were also issued relative to the carrying of wireless telegraph watchers on board in place of one or more certificated wireless operators.

In January, 1921, the foundation stone was laid of the new high power wireless station at Sainte Assise, near Paris. This station is divided into three sections, devoted respectively to Long-range Oversea communications, Continental routes in Europe, and special duplex services to London and Madrid.

On November 5th, President Harding formally opened the first section of the New York Radio Central Station.

On November 20th test messages transmitted from Carnarvon with a new valve transmitting plant were read in Australia, a distance of approximately 12,000 miles. Special press messages were also transmitted.

In December, a demonstration of duplex wireless telephony between London and Amsterdam, Holland, was given by Marconi's Wireless Telegraph Company, Limited. An unusually short wavelength was employed, giving immunity from interference from other stations.

The first station of the British Imperial Wireless Chain at Leafield, near Oxford, was formally opened on August 18th by the Postmaster-General.

An International Wireless Conference was held in Paris in June, at which representatives from the leading nations discussed the regulation of the use of wireless and the allocation of certain wavelengths for various ranges and purposes.

An Imperial Conference was held in London during July and August to discuss improved communications within the British Empire. With regard to wireless communications it was agreed that steps be taken by H.M. Government for the erection of the remaining stations of the Imperial chain for which they are responsible, that the Governments of the Union of South Africa, of Australia and of India, should take similar action, and that the Government of Canada and New Zealand should co-operate. The Radio Research Board were also asked to investigate and report on the development and present position of Wireless Telephony.

La Compagnie Radio-France was constituted in June for the construction, erection and working of radio stations in France for European and Transocean communication.

The Radio Corporation of America effected agreements or amalgamations with the following firms to enable a pooling of all radio patents owned by them to be made:—The Westinghouse Electric and Manufacturing Company, The American General Electric Company, The International Radio Telegraph Company, the American Marconi Company, the American Telephone and Telegraph Company, and the United Fruit Company.

A merger was also effected between the Marconi Wireless Telegraph Company of Canada and the Canadian General Electric Company.

By agreement with the Peruvian Government, Marconi's Wireless Telegraph Company, Ltd., took over and agreed to operate for a period of twenty-five years the whole of the postal, telegraph and wireless services of Peru. Sir William Slingo, late Engineer-in-Chief of the British Post Office, accepted the position of Chief of the Department. The Compagnie Générale de T.S.F. has also concluded a contract for a period of thirty years with the Government of Ecuador for the working of similar services in that State.

1922

During 1922 the first steps were taken in Great Britain to start the broadcasting of wireless telephony, which has assumed such large proportions.

Valves in which the anode is a metal cylinder sealed to a glass portion and capable of giving an output of 100 kW., have reached the manufacturing stage.

In Australia an agreement was made with Amalgamated Wireless (Australasia), Ltd., by the Government by which all the wireless services existing in the country were combined under the joint ownership of the Company and the Government.

The Company took over the whole of the coastal and commercial land stations in Australia and New Guinea, together with the entire staff of the Commonwealth Radio Service.

During the summer a 25 kW. arc station at Urumsti (Eastern Turkestan) was completed, and this station has been in direct communication with several stations in India.

A 25 kW. arc station at Kashgar has now been completed.

Remarkable possibilities have been opened by some pioneer work on short wave directional wireless begun by Senatore Marconi in 1916, and continued recently by C. S. Franklin. The former used short damped waves of two or three metres, while the latter has concentrated on the use of continuous waves of about 15 metres obtained by means of thermionic valve transmitters. Large reflectors were used, which, besides giving marked directional effects, made wireless telephony carried out with the same wavelength almost distortionless. With the use of reflectors of dimensions large compared with the wavelength the directional effect is very marked, so that the possibility of a wireless "lighthouse" with a revolving beam is definitely established. As will be seen in the record for 1924, these investigations have had important developments.

In France progress was made in the construction of high frequency alternators, the efficiencies of the 250 kW. 20,000 cycle alternator being about 79 per cent., and of a 500 kW. 15,000 cycle machine about 84 per cent. Static frequency multipliers were investigated by M. Marius Latour, who developed one with a magnetic circuit of an iron-nickel-manganese alloy having a very high resistivity, and reaching saturation at very low magnetic induction.

An important development in Germany was the wireless telephone transmission of messages by the "Eildienst-Gesellschaft m.b.H." Since September 1st, 1922, a continuous wireless telephone service has been maintained every day from 8 a.m. till 6 p.m., on a wavelength of 4,000 metres, by the 10-kW. Telefunken valve transmitter of the Königswusterhausen station, about 30 km. from Berlin; the transmitter is operated from Berlin. Messages chiefly concern the rate of exchange in Berlin, London, Paris, New York as well as the "Weltmarkt" prices of the most important raw materials. As aërials, small L. and T. antennæ five to ten metres above the roofs are used. The receivers consist of a simple audion with reaction coupling and secondary circuit, or for a distance of more than 300 km., a two-valve audio frequency amplifier in addition.

In Japan steady progress was made in the development of high frequency telephony over power lines and radiotelephony over short distances. Successful communication was effected by high frequency telephony over the lines of the Ujigawa Electric Company, the line employed being 34 kilometres long and carrying a 55,000 volts three-phase supply.

1923

The most notable feature in wireless communication in 1923 was the great extension in broadcasting, or the transmission of news and entertainment to an unlimited audience.

In Great Britain the British Broadcasting Company was incorporated on December 15th, 1922. The Company immediately set to work to erect a chain of Broadcasting Stations, supplemented later by Relay Stations.

These latter are intended to have lower power than the main centres, and the programmes are for the most part transmitted from one of the latter over the Post Office telephone lines.

The broadcasting of concerts, etc., was started also in France, Sweden, Holland, Germany, Denmark, Italy, Brazil and Argentine, and the formation of Broadcasting Companies in Norway, Sweden, South Africa and Australia was effected.

In Australia a conference on Broadcasting proposed that broadcasting should be decentralized, each district to have a Broadcasting Company which will use a fixed wavelength and will obtain its revenue from listeners who will have sealed instruments. Preference to be given to Australian and British instruments.

The revenue of the British Broadcasting Company was to be derived partly from half of the fee charged by the Post Office for the licence, and in the second place a royalty on the sale of instruments by the firms which composed the Broadcasting Company.

The construction of home-made receivers attained to such dimensions, and also the number of persons who neglected to obtain the Government licence was estimated to be so large, that the prospects of the revenues of the Broadcasting Company were seriously affected. Accordingly the Postmaster-General appointed a Committee to consider the whole question. As a result of the Committee's deliberation, it was proposed that the Broadcasting Company shall have three-quarters of the licence fee, but that the royalties on the sale of apparatus shall be discontinued. These recommendations have since been carried out, and as a consequence the finances of the Company have been established on a sound basis.

Although negotiations for the establishment of an Imperial chain of radio stations which are to link the various units of the British Empire together were made, no settlement was effected in 1923, but as will be seen from the record for 1924, a scheme has been approved and put into operation.

The Post Office acquired an area of 800 acres at Hillmorton, near Rugby, and proceeded with the erection of a transmitting station to form part of the Imperial Wireless Scheme.

The Marconi Company made a tender, which was accepted, for the erection of a transmitting station in Australia of a power of 1,000 kilowatts, with 20 steel masts 800 feet high. Corresponding stations were to be provided in England and Canada. The receiving arrangements would permit of simultaneous reception from five stations.

In South Africa a company called "The Wireless Company of South Africa" was registered at Cape Town for erecting and working a station for overseas communication.

The new high power station at Warsaw, which has been erected by the Radio Corporation of America, was completed.

Direct wireless services between America and Holland and America and Italy were put in operation.

The land line telephone system of Denmark was linked up to the Island of Bornholm by means of radio telephone transmitters on that island, and at Lyngby, near Copenhagen. The distance between these transmitters is 150 kilometres (93 miles).

A French company commenced a 100 kilowatt station at Rakovica, near Belgrade, with a receiving station at Laudon Trench, a suburb of the latter city.

In Belgium the erection at Ruysselede, near Bruges, of a new high power station was started.

An Austrian Marconi Company, with a capital of £130,000 was founded, and proceeded with the erection of a high power station at Vienna for communicating with foreign countries, for which a thirty years' monopoly has been granted. The company has taken over the various Austrian stations which were erected during the war.

The German high power station at Nauen had extensive additions made to it for carrying on communication with various places more commodiously.

The construction of a large radio station in a valley between the Herzogstand and the Stein, two of the foothills in the Bavarian Alps was undertaken. The aerial will be suspended by wire cables stretched between the tops of the two hills, the aerial wires being suspended from these cables.

Communication between Holland and Dutch East Indies was effected by the erection of stations at Assel, in Holland, and Malabar (Java), by the Telefunken Company.

Four high power stations were under construction for communication between France and her Colonies. At Bamako, near Timbuktu, high-frequency alternators are to be installed, and will give an aerial input of 100 kilowatts. The aerial will be carried by six 120-metre masts, a total length of 1,000 metres being attained by means of four shorter masts.

Portugal was provided with an efficient and up-to-date system of communication with her colonies.

On the conversion of the Madras Wireless Station for high speed automatic signalling, which is now being effected, the traffic between India and Burma will be diverted to this station from the cable and land lines between Calcutta and Rangoon.

An agreement was made between the Radio Corporation of America and the Chinese Government for the erection of five high power stations in China, the principal one being at Shanghai.

Lower power stations will also be erected for communication between Shanghai, Peking, Canton and Harbin. The stations will be erected by the Federal Telegraph Company, who will operate them jointly with the Chinese Government, and they are expected to be completed in 1925.

The Japanese Missui Company have recently completed the erection of a station at Peking, and communication has been established with Bordeaux.

A high power station is under construction by the Brazilian Wireless Telegraph Co.

The Punta Arenas station in Southern Chile was equipped with a valve continuous wave transmitter, and has established communication with Stanley, Falkland Islands.

The Monte Grande station, which was put into service, is a high power Argentine station, and has a T-shaped flat-topped aerial, carried by ten masts of 210 metres, spaced 500 metres apart, and having multiple earth connections. The plant comprises two 400 kilowatt high frequency alternators, which will give a radiation of 110,000 metre-amperes. The receiving station is at Villa Elisa, nearly 40 kilometres from both Monte Grande and Buenos Aires.

The Canadian Government are erecting six stations, primarily for official use, at Dawson City and places on the Mackenzie River.

The increase in traffic on some of the large liners of the Atlantic route led to the installation of apparatus for high speed automatic transmission and reception on several lines.

Successful tests on wireless-controlled aeroplanes were carried out at the Etampes Aerodrome in France. Flights were made without a pilot. Flights were also made with a pilot using a gyroscopic stabiliser and special steering motors which could be controlled from the ground.

The International Commission for Aerial Navigation agreed, as a general principle, that all aircraft engaged in public transport must carry wireless apparatus.

A number of radio fog signals have been installed on the Atlantic and Pacific coasts of the U.S.A. Eight of these signal apparatus have been installed, and five more are being established. Ten of the signals will be on lightships.

The Wireless Society on November 22nd, 1922, changed its title to the Radio Society of Great Britain.

An interesting form of receiving electrode tube has been described by Mr. A. W. Hull, of the Research Laboratory General Electric Co., U.S.A. This is a combination of the kenotron rectifier and pliotron, which enables the employment of alternating current for supplying the energy required in a valve receiving circuit without the hum which usually accompanies its use when ordinary three-electrode valves are used.

During the past year considerable progress has been made in the development of high power valves having external metal anodes. This construction allows the anode to be water-cooled.

The General Electric Company of America, developed a valve capable of delivering 20 kilowatts of high frequency energy to an aerial. Using six of these in parallel with 15,000 volts on the anode a current of 310 amperes in an Alexanderson multiple tuned aerial was obtained.

A valve of the magnetron type was developed by the same company capable of giving 1,000 kilowatts at 20,000 cycles with an efficiency of 70 per cent.

In the ordinary three-electrode valve the magnetic effect of the current used to heat the filament does not have any important effect upon the electron emission from filament to anode. In a recent communication to the American Institute of Electrical Engineers, Mr. A. W. Hull has shown that in certain cases it is possible for this magnetic field to totally interrupt the electron emission when the filament current exceeds a certain value depending on the geometrical constants of the tube and the anode potential. This effect only becomes marked at very large filament currents, and hence can only be applied to any useful purpose at high powers.

1924.

During 1924 broadcasting continued to develop and the British Broadcasting Company now have nineteen stations operating, nine being main stations, including one at Belfast, and the remainder relay stations. Extensive tests were also carried out with a temporary high power station at Chelmsford working on a wavelength of 1,600 metres, and as a result the erection of a permanent station at Daventry was commenced. The object of this station is to reach a large number of persons who are too distant from the local stations to be able to utilize the less sensitive but cheaper crystal receivers.

On several occasions in the early part of the year the British Broadcasting Company broadcast from their stations a programme transmitted from the station KDKA at East Pittsburgh, Pennsylvania, U.S.A., belonging to the Westinghouse Electric Co.

The signals, which were on a wavelength of 100 metres, were received at the Aerodrome, Biggin Hill, Kent, by a circuit which included 6 high-frequency, 1 detector and 2 low-frequency valves; and then sent over the Post Office telephone lines to the London broadcasting station, 2 LO, whence they were distributed by landline to the other stations and simultaneously broadcast.

In June the tariff paid by manufacturers of broadcast receivers to the British Broadcasting Company was abolished, and a uniform licence of ten shillings was instituted in place of the two types previously in force.

A notable event in connection with broadcasting, was the broadcasting of speeches by H. M. King George V and H.R.H. The Prince of Wales on the occasion of the opening of the British Empire Exhibition at Wembley, simultaneously from all the stations of the British Broadcasting Company.

A feature of this event was the provision by a number of firms, newspaper companies and others, of open-air installations equipped with loud speakers.

A welcome feature of the extension of broadcast services which is taking place over the whole world, is the large share which British manufacturers have secured in providing the equipment of the stations. The Marconi Company has provided the apparatus for the Brussels, Rome, Rio de Janiero, Limar, and also at Capetown, Durban.

In Australia, new regulations for the establishment of broadcast services have been made. It is provided that in Victoria and New South Wales, stations may employ 5 kW. or $1\frac{1}{2}$ kW. power. In Queensland, South Australia and Western Australia at least 5 kW., and in Tasmania 3 kW. must be used. The broadcast service must be started within six months of the licence for it is granted.

Stations have been equipped at Melbourne, Sydney, Adelaide and Perth.

In the United States where the broadcast services have been provided free by organisations of various types including firms interested in radio manufacturing and newspaper companies, and no funds are available for the maintenance of the services, a large part of the programmes have consisted of musical and similar items for which no royalties have been paid.

Owing to the demands which have been made for payment of royalties for permission to perform items of this nature the question of providing a proper financial foundation of the broadcast services has been taken up.

In Italy a broadcasting organisation has been formed by a group of five firms and a broadcast station has been erected at Rome, a further one at Milan being projected.

The high power station at Monte-Grande, Argentine, the erection of which was recorded in last year's YEAR BOOK, was opened in January for direct communication with New York, Paris and Berlin. The service will be extended to Great Britain when a corresponding transmitting station is available. The power of the station is 800 kW., the aerial being carried on ten masts each 690 ft. high. The receiving station is at Villa Eliza 30 kilometres from Buenos Aires, the actual control being effected from a central office in Buenos Aires.

A radiotelegraphic service was inaugurated in January between Great Britain and Austria by Marconi's Wireless Telegraph Co., Ltd., and the Austrian Marconi Company. The transmitting stations are at Ongar, Essex, and Deutsch-Altenburg near Vienna, whilst the receiving stations are at Brentwood, Essex, and Laaerberg respectively.

The whole system is controlled directly from the telegraph offices in London and Vienna, the services being direct and duplex.

In February of last year, the Government appointed a Committee to report on the whole subject of the Imperial wireless scheme. The Committee, in their report, which was presented in a very short period, recommended that the Post Office should own and operate directly all wireless stations for communication with the various parts of the Empire but that the business organisation for effecting this should be greatly improved. As an alternative in the case of Canada, the present competition between the Post Office and private enterprise might be continued, provided that in any licence granted therefore the public interests should be safeguarded.

In any licence granted to a private company the State should reserve to itself the right to take over the working of licensed stations in case of emergency.

As regards Continental Europe and the rest of the world the Committee recommended that private enterprise be given facilities to develop wireless communication, subject in the first case to terms being arranged for the

payment of royalties in view of the competition with State-owned cables thus set up. Another recommendation was that the station at Cairo should be removed from the Empire scheme, and Stonehaven and Caister should be closed as soon as possible. It was also recommended that the stations at Leaffield and Rugby should be increased in power.

Subsequent to the publication of the above report negotiations were opened by Marconi's Wireless Telegraph Company, Ltd., with the Government with a view to the new "beam" system being utilised for the Imperial scheme.

In July an agreement was concluded between the Postmaster-General and Marconi's Wireless Telegraph Co., Ltd., for the construction of a wireless station on the beam system, capable of communicating with Canada and of being extended to India, South Africa and Australia.

The main features were as follows :

The sites for the transmitting stations to be provided by the Government. The transmitting station to have an input of at least 20 kW. and the receiving station to have an aerial designed to focus the received waves within an angle of 30 degrees.

The station for communicating with Canada is to be completed within 26 weeks of the time that the sites are handed over to the Company, and a similar station in Canada to be available within the same period.

The stations are to be worked by remote control from the Central Telegraph Office, London, and to be capable of communication at a speed of 100 five-letter words per minute each way for an average of eighteen hours per day. Additional stations are to be provided within six months of the date the order is placed if only one unit is ordered, or nine months if more than one unit is ordered. Each of these units will be required to comply with the same conditions except that the average periods of communication are to be, with South Africa, eleven hours, India twelve hours, and Australia seven hours.

In addition to the cost of erection of the station, the Marconi Company are to receive six and a quarter per cent. of the gross receipts of the station so long as any Marconi patents essential for the working of such station are employed therein.

Before the stations are taken over by the Post Office they will be required to comply with a number of tests.

The publication of the agreement led to developments in the Dominions with a view to the beam system being tried. The Wireless Telegraph Company of South Africa commenced the erection of a beam station at Kliphennel near Cape Town to communicate with England. In India, four beam stations for communication in the Imperial System were also commenced, and in Australia the erection of a similar beam station has also been undertaken.

The Marconi Wireless Telegraph Company of Canada, Ltd., are erecting beam stations at Montreal and Vancouver to form part of the scheme.

The short-wave directional system of radiotelegraphy and the results obtained in the tests made on it were described in a lecture before the Royal Society of Arts in July by Senatore Marconi.

Although the first practical demonstrations of radio communication were carried out on short waves, yet as progress was made in establishing communication over longer and longer distances, the wavelengths of the oscillations employed became longer and longer, and the possibilities of short waves were largely neglected.

In 1916 Senatore Marconi commenced an investigation with the assistance of Mr. C. S. Franklin for war purposes of short wave beams obtained by the use of reflectors, which at first were made in the form of a number of wires

parallel to the actual aerial and arranged on a parabolic curve with the aerial at the focus.

The possibilities of the system seemed so great that the investigation has been continued. A very great advance was due to an arrangement invented by Mr. Franklin in which a reflector composed of a number of parallel wires all arranged in a straight line, the aerial being formed by a similar system of wires in a straight line. These aerial wires were energised simultaneously from the generator by a special system which ensures that the phase of the oscillations in each wire is the same. This method has the advantage that considerably more energy can be radiated than is possible by the use of a single aerial and the directivity of the beam is very good.

In 1919, valve generators for the production of very short wavelengths were developed and the beam system was put to practical use by its employment in a test of a wireless telephone system between Hendon and Birmingham a distance of 97 miles. Measurements showed that the energy received with the reflector in use was 200 times that obtained without it.

In 1923 a series of tests were carried out between an experimental transmitter at Poldhu and a receiving set on the S.Y. "Elettra." The wavelength was 100 metres, and the object of the tests was to ascertain the reliability of the signals, with and without a reflector at the transmitter, and also the conditions affecting their propagation during day and night.

The angle or spread of the beam of the radiation was also measured.

The result of the tests showed that short waves were much more regular and reliable than had been supposed and that a system of telegraphy employing reflected beams was not only possible, but possessed very many advantages.

With a transmitter using 12 kW. energy and equipped with a reflector, the wavelength being 97 metres, it was found that at St. Vincent, Cape Verde Islands (2,330 miles) reception was possible for some hours after sunrise and before sunset whilst night signals were very strong the strength being estimated at between 400 to 500 microvolts per metre.

The power at the transmitter was reduced gradually to 1 kW. and even then signals were stronger than necessary for commercial work.

Tests were also carried out with increased power at the transmitter but not using the reflector and signals were received at New York, and using a parabolic reflector at Buenos Aires, with a total power of 28 kW. Wireless telephony transmission to Sydney, New South Wales, was effected in May.

In February a discussion on Loud Speakers and the various problems associated with them was organised jointly by the Institution of Electrical Engineers and the Physical Society of London. The meeting was spread over two sessions and a number of papers were read. Many of those interested in the problems also contributed to the discussion. Papers on loud speakers, the reproduction of speech and music and kindred subjects have also been read before the American Institute of Electrical Engineers.

RESUMÉ OF INTERNATIONAL WIRELESS TELEGRAPHIC AND TELEPHONIC LEGISLATION

INTERNATIONAL legislation relating to Wireless Telegraphy dates back to the year 1903 when the increasing use of Wireless Telegraphy for Maritime purposes throughout the world rendered it imperative that an international agreement should be formulated.

A conference met in Berlin in August, 1903, on the invitation of the German Government, at which all the Powers represented, with the exception of Great Britain and Italy, agreed to certain proposals, to be considered in detail at a subsequent conference, for the international regulations of Wireless Telegraphy.

In October, 1906, a second International Conference was held in Berlin at which the following matters were discussed :—(1) The acceptance and transmission of telegrams. (2) The adoption of rules of working. (3) The provision of means of collecting charges and settling accounts between different countries. (4) Arrangements for the publication of all information necessary for intercommunication. (5) Rules to prevent interference and confusion in working, with adequate provision for enforcement. (6) Provision that, with certain exceptions, intercommunication must not be refused on account of the difference in the system of Wireless Telegraphy employed.

The documents signed at Berlin on November 3rd, 1906, consisted of :—(a) The Convention. (b) The Additional Undertaking. (c) The Final Protocol. (d) The Service Regulations. These documents were revised at the London Conference in 1912, and the Radiotelegraphic Convention which came into operation on July 1st, 1913, is printed in the following pages. Sir Henry Babington Smith presided and the delegates represented the administrative, executive and technical officials of the postal telegraphs and cable departments of the various countries represented, together with naval and military officers, diplomats, scientists, meteorologists and prominent persons interested in the technical, commercial and humanitarian development of wireless telegraphy.

The Central Agency, which has been established for collecting and distributing information in accordance with the requirements of the Convention, is a Branch of the Bureau of the International Telegraph Union situate in Berne, Switzerland. It has no executive or initiative power, its functions being practically confined to the collection and circulation of information in accordance with Article 13 of the Convention and Section XII of the Service Regulations annexed thereto.

The International Radiotelegraphic Convention places the sum of 80,000 francs per annum at the disposal of the Bureau, which it must not exceed; this sum is supplied by the governing bodies of the contracting States as set forth in Article 43 of the Service Regulations.

The ever-increasing work of the Bureau may be gauged by the number of stations dealt with, which has grown from 508 in 1908 to 16,122 in 1923, while the frequent changes in wavelengths, in the nature of transmissions and other details connected with established stations, necessitates a vast amount of care and labour in preparing the monthly supplements issued from Berne. The fact that the Bureau can still keep its expenses within the prescribed limits is proof of the economical and efficient manner in which the work is conducted.

The following is an extract from the report issued in 1923, which has been amended and revised up to October 1st, 1924.

THE RADIOTELEGRAPHIC CONVENTION OF LONDON.

The Radiotelegraphic Convention of London has been ratified by all the Contracting Countries with the exception of the Argentine Republic, Persia and Turkey. The International Bureau has deemed it advisable to notify this fact to the diplomatic representatives of these three states at Berne.

The Irish Free State and the Territory of Tanganyika under British control have now adhered to the Convention.

The High Commissioner of the French Republic in Syria and Lebanon has signified that the Administration of Posts and Telegraphs in these territories will conform with the terms of the Convention and the Radiotelegraphic Regulations.

The Administration of Posts and Telegraphs in the State of Fiume has stated that it will conform with the terms of the Convention and those Regulations which are necessary for the regular transmission of radiotelegrams and the settlement of accounts.

The Governments of French Guiana and of Iraq as well as the Administration of Finland have notified their wish to conform with the terms of the Convention and the annexed service regulations. In addition the Administrations of Luxembourg and the Dominion Republic as well as the Dutch Colonial Minister, in the name of the Governor of the Colony of Surinam (Dutch Guiana), have undertaken to apply to their international radiotelegrams the regulations concerning transmissions and conformity.

Lastly, the French Colonial Ministry states that the Radiotelegraphic Service of the Islands of S. Pierre and Miquelon will conform with the terms of the regulations for International Service in matter relating to the keeping of records, charges and conformity.

The following list shows all adhesions to the Convention of London and the dates of such adhesions :—

Argentine Republic	.. .. .	12th March, 1914.
Austria	.. .. .	23rd November, 1912.
Belgium and Belgian Congo	.. .. .	13th October, 1915.
Bolivia	.. .. .	18th December, 1914.
Brazil	.. .. .	27th April, 1914.
Bulgaria	.. .. .	7th March, 1923
Cameroons (French)	.. .. .	16th April, 1914.
Chile	.. .. .	1st September, 1920
China	.. .. .	25th August, 1914.
Columbia	.. .. .	16th January, 1918.
Cuba	.. .. .	23rd April, 1920.
Czechoslovakia	.. .. .	22nd June, 1921.
Danzig (Free Town of)	.. .. .	14th February, 1913.
Denmark	.. .. .	1st February, 1913.
Egypt	.. .. .	17th April, 1920.
Equador	.. .. .	1st July, 1923
Esthonia	.. .. .
France and Algeria, including French Equatorial Africa, French West Africa, Tunis, Indo-China and Madagascar	.. .. .	17th February, 1914.
French Oceanic Establishments	.. .. .	3rd February, 1916.
Guadelope	.. .. .	10th January, 1917.
Martinique	.. .. .	13th February, 1917.
New Caledonia	.. .. .	19th February, 1915.
Réunion	.. .. .	29th October, 1923.
Germany	.. .. .	21st June, 1913.
Great Britain, Colonies and Dependencies— including Union of South Africa, Australian Commonwealth, Dominion of Canada, British West Indies, New Zealand and the following protectorates: Barbados, Basutoland, Bermudas, British North Borneo, Ceylon, Cyprus, Gold Coast (and Ashanti), Malay States (Perak, Selangor, Negri-Sembilan, Pahang), Gambia, Gibraltar, British Guiana, British Honduras, Hong-Kong, Bahama Islands, Windward Islands (Grenada, St Lucia, St. Vincent), Falkland Islands, Fiji Islands, Leeward Islands (Antigua, Montserrat, St. Kitts and Christopher, Dominica, Virgin Islands), Jamaica (Turques, and Caicos, Caymans Islands), Kenya, Malta, Mauritius, Northern Nigeria, Southern Nigeria, Western Pacific Possessions (Fanning Islands, Gilbert and Ellice Islands, British Solomon Islands), Bechuanaland Protectorate, Nyassaland Protectorate, Somaliland Protectorate, Northern Rhodesia, Southern Rhodesia, Seychelles Islands, Sierra- Leone, St. Helena, Straits Settlements (Labouan, Cocos Islands), Swaziland, Trinidad and Tobago, Uganda, Weihaiwei	.. .. .	2nd June, 1913.
Brunei	.. .. .	13th September, 1923.
Norfolk Islands, Papeete, Terre-Neuve	.. .. .	2nd June, 1913.
Sarawak	.. .. .	23rd April, 1914.
Tanganyika Territory	.. .. .	5th May, 1924.
Tonga Islands	.. .. .	28th May, 1915.
Zanzibar	.. .. .	14th July, 1913.
Greece	.. .. .	24th July, 1914.
Guatemala	.. .. .	10th July, 1914.
Holland, Netherland Indies and Colony of Curaçao	.. .. .	20th March, 1913.
Hungary	.. .. .	12th March, 1914.
Iceland	.. .. .	26th February, 1919.

Irish Free State	22nd April, 1924.
Italy, including Italian Colonies and Possessions (Eritrea and Italian Somaliland)	18th June, 1913.
Italian Possessions in Cyrenaica and Tripolitana	13th January, 1914.
Japan, including Chosen, Formosa, Kwantung, Sakhalin	16th July, 1913.
Lettonia	1st January, 1922.
Mexico	6th October, 1913.
Monaco	10th December, 1912.
Morocco, excepting the Spanish Zone	2nd November, 1914.
Norway	8th October, 1913.
New Hebrides	8th September, 1921.
Panama	14th July, 1914.
Persia	
Peru	12th July, 1915.
Poland	7th January, 1921.
Portugal and Portuguese Colonies, including Portuguese Africa, Portuguese East Africa and Portuguese Asiatic Possessions	2nd December, 1913.
Roumania	27th June, 1913.
Russia and Russian Protectorates and Possessions, including Asiatic Central Russia, Boukhara, Khiva, Western Siberia, Eastern Siberia	5th April, 1923.
St. Marino	1st August, 1913.
Serbes, Croates and Slovenes	17th June, 1919.
Siam	30th May, 1913.
Spain and Colonies	27th June, 1913.
Sweden	30th May, 1913.
Switzerland	26th February, 1923.
Turkey	
Uruguay	29th February, 1916.
U.S.A., including Alaska, Hawaii, Philippine Islands, Porto Rico and Possessions, Panama Canal Zone	21st February, 1913.
Venezuela	13th August, 1920.

The signing of the International Convention for the safety of Life at Sea on January 20th, 1914, constituted a most noteworthy advance in the legislation relating to Wireless Telegraphy. The Convention was drawn up by an International Conference which met in London on November 12th, 1913, and laid down, *inter alia*, the minimum Wireless Telegraphy equipment to be carried by ships of different grades. For the purpose of defining the hours of service (*i.e.*, setting out the times when the various stations are to open for the receipt and transmission of messages) the Radiotelegraphic Convention, 1912, divided ship stations into three classes, but did not specify which vessels (by virtue of the services maintained on board) should be placed in the various classes. Under the provisions of the Safety of Life at Sea Convention which deal with Wireless Telegraphy, these classes are clearly defined.

INTERNATIONAL RADIOTELEGRAPHIC CONVENTION

London, July 5th, 1912.

INTERNATIONAL Radiotelegraphic Convention concluded between Great Britain and various British Colonies and Protectorates,* Union of South Africa, Commonwealth of Australia, Canada, British India, New Zealand, Greece, Italy and Italian Colonies, Germany and Protectorates, United States of America and Possessions, Argentina, Austria, Hungary, Bosnia-Herzegovina, Belgium, Belgian Congo, Brazil, Bulgaria, Chili, Denmark, Egypt, France and Algeria, French West Africa, French Equatorial Africa, Greece, Indo-China, Madagascar, Tunis, Japan and Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung, Morocco, Monaco, Norway, Netherlands, Dutch Indies, Curaçoa, Persia, Portugal and Portuguese Colonies, Roumania, Russia and Russian Possessions and Protectorates, San Marino, Siam, Spain and Spanish Colonies, Sweden, Turkey and Uruguay.

The undersigned Plenipotentiaries of the Governments of the countries enumerated above, being assembled in Conference in London, have, by mutual consent, and subject to ratification, concluded the following Convention :—

ARTICLE 1.

Application of Provisions

The High Contracting Parties undertake to apply the provisions of the present Convention at all the radiotelegraph stations (coast stations and ship stations) which are established or worked by the Contracting Parties and open for the service of public correspondence between the land and ships at sea.

They undertake, moreover to impose the observance of these provisions upon private enterprises authorised either to establish or to work radiotelegraphic coast stations open to the service of public correspondence between the land and ships at sea, or to establish or to work radiotelegraphic stations whether open for public correspondence or not on board the ships which carry their flag.

ARTICLE 2.

Interpretation of Terms.

The term coast station means radiotelegraphic station established on land or on board any ship permanently anchored and used for the exchange of correspondence with ships at sea.

The term ship station means any radiotelegraphic station established on board a ship other than a permanently moored ship.

ARTICLE 3.

Compulsory Interchange of Messages.

Coast stations and ship stations are bound to exchange radiotelegrams reciprocally without regard to the radiotelegraph system adopted by such stations.

Each ship station is bound to exchange radiotelegrams with any other ship station without distinction as to radiotelegraphic system adopted by such stations.

Nevertheless, in order not to impede scientific progress, the provisions of the present Article do not prevent the contingent employment of a radiotelegraphic system incapable of communicating with other systems, provided that such incapacity be due to the specific nature of such system and that it be not caused by devices adopted solely with the object of preventing inter-communication.

ARTICLE 4.

Restriction of Service.

Notwithstanding the provisions of Article 3, a station may be appropriated to a restricted public service determined by the object of the correspondence or by other circumstances independent of the system employed.

ARTICLE 5.

Connection with Land Telegraph System.

Each of the High Contracting Parties undertakes to cause the coast stations to be connected with the telegraph system by means of special wires, or at least, to take such other measures as will ensure a rapid exchange between the coast stations and the telegraph system.

ARTICLE 6.

Notification of Particulars.

The High Contracting Parties shall mutually notify one another of the names of the coast stations and ship stations covered by Article 1

* Barbados, Basutoland, Bermudas, Borneo, Ceylon, Cyprus, Gold Coast and Ashanti, Malay States (Perak, Selangor, Negri Sembilan, Pahang), Gambia, Gibraltar, British Guiana, British Honduras, Hong Kong, Bahama Islands, Windward Islands (Grenada, St. Lucia, St. Vincent), Falkland Islands, Fiji Islands, Jamaica, Turks and Caicos Islands, Cayman Islands, Leeward Islands (Antigua, Montserrat, St. Kitts-Nevis, Dominica, Virgin Islands), Malta, Mauritius, Northern and Southern Nigeria, Western Pacific Islands (Fanning Island, Gilbert and Ellice Islands, British Solomon Islands), East African Protectorate, Uganda, Bechuanaland, Nyassaland, British Somaliland, Northern and Southern Rhodesia, Seychelles, Sierra Leone, St. Helena, Straits Settlements (Labuan, Cocos Islands), Swaziland, Trinidad and Tobago, Wei-hai-wei.

as well as of all the particulars necessary to facilitate and accelerate the radiotelegraphic exchanges as specified in the Detailed Regulations.

ARTICLE 7.

Other Radiotelegraphic Arrangements.

Each of the High Contracting Parties reserves to itself the right to prescribe or to permit in the stations covered by Article 1— independently of the installation of which the particulars are published conformable to Article 6—the installation and working of other arrangements designed for special radiotelegraphic transmission without publication of the details of such devices.

ARTICLE 8.

Interference with Other Stations.

The working of radiotelegraphic stations shall be organised as far as possible in such a manner as not to interfere with the working of other stations of the kind.

ARTICLE 9.

Distress Calls.

Radiotelegraphic stations shall be obliged to accept with absolute priority calls of distress from whatever source, to reply in like manner to such calls, and to give the effect to them which they require.

ARTICLE 10.

Charges.

The charge for a radiotelegram shall include according to the circumstances:—

1. (a) The "coast charge" which accrues to the coast station.

(b) The "ship charge" which accrues to the ship station.

2. The charge for transmission over the lines of the telegraph system, calculated in accordance with the ordinary rules.

3. The transit charges of the intermediate coast or ship stations and the charges appertaining to special services required by the sender.

The rate of the coast charge shall be subject to the approval of the Government to whose authority the coast station is subject, and the rate of the ship charge to the approval of the Government to which the ship belongs.

ARTICLE 11.

Validity and Modifications.

The provisions of the present Convention are completed by Detailed Regulations which have the same validity and come into force at the same time as the Convention.

The provisions of the present Convention and of the Regulations relating thereto may be modified at any time by mutual consent of the High Contracting Parties. Conferences of Plenipotentiaries having power to modify the Convention and the Regulations shall take place periodically; each Conference shall itself fix the place and time of the succeeding Conference.

ARTICLE 12.

Exercise of Voting Powers.

These Conferences shall be composed of Delegates of the Governments of the Contracting Parties.

In the deliberations each country shall have one vote only.

If a Government adhere to the Convention or its colonies, possessions or protectorates, subsequent Conferences may determine that the whole or part of such colonies, possessions or protectorates is to be regarded as forming a country for the purposes of the foregoing clauses. But the number of votes to be exercised by a Government, including its colonies, possessions or protectorates, may not exceed six.

The following are regarded as forming a single country for the purposes of the present Article:—

The Union of South Africa.

The Australian Commonwealth.

Canada.

British India.

New Zealand.

Ex-German East Africa.

Ex-German South-West Africa.

The Cameroons.

Togoland.

The Ex-German Pacific Protectorates.

Alaska.

Hawaii and the other American possessions in Polynesia.

The Philippine Islands.

Porto Rico and the American possession in the Antilles.

The zone of the Panama Canal.

The Belgian Congo.

The Spanish Colony of the Gulf of Guinea.

French West Africa.

French Equatorial Africa.

Indo-China.

Madagascar.

Tunisia.

Eritrea.

Italian Somaliland.

Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung.

The Dutch Indies.

The Colony of Curaçao.

Portuguese West Africa.

Portuguese East Africa and the Portuguese possession in Asia.

Russian Central Asia (littoral of the Caspian Sea.)

Bokhara.

Khiva.

Western Siberia (littoral of the Arctic Ocean).

Eastern Siberia (littoral of the Pacific Ocean).

ARTICLE 13.

Collection of Information.

The International Bureau of the Telegraph Union shall be entrusted with the duty of collecting, co-ordinating, and publishing information of every kind relating to radiotelegraphy; of circulating in proper form proposals for the modification of the Convention and of the Regulations; of notifying the changes adopted, and, generally, of carrying out any Administrative work which it may be called upon to undertake in the interests of International Radiotelegraphy.

The expenses of this institution shall be borne by all the Contracting Parties.

ARTICLE 14.

Conditions of Transmission and Receipt.

Each of the High Contracting Parties reserves to itself the right to fix the conditions under which it will admit radiotelegrams coming from or destined for a station, whether a ship station or a coast station, which is not subject to the provisions of the present Convention.

If a radiotelegram is admitted, the ordinary charges must be applied to it.

Every radiotelegram originating at a ship station and received by a coast station of the contracting country, or accepted in transit by the Administration of a contracting country shall be sent forward.

Every radiotelegram intended for a ship shall also be sent forward if the Administration of the contracting country has accepted it from the sender, or if the Administration of a contracting country has accepted it in transit from a non-contracting country, subject to the right of the coast station to refuse transmission to a ship station belonging to a non-contracting country.

ARTICLE 15.

Further Applications.

The provisions of the Articles 8 and 9 of this Convention are equally applicable to radiotelegraphic installations other than those indicated in Article 1.

ARTICLE 16.

Admission of New parties.

Governments which have not taken part in the present Convention shall be allowed to become party to it at their own request.

Such adherence shall be notified through diplomatic channels to that one of the contracting Governments in whose territory the last Conference was held and by that Government to the others.

Such adherence shall involve complete acceptance of all the clauses of the present Convention and admission to all the advantages stipulated therein.

The adherence to the Convention of the Government of a country having colonies, possessions, or protectorates shall not carry with it the adherence of the colonies, possessions, or protectorates of such Government, unless a declaration be made to that effect by such Government. These colonies, possessions, or protectorates as a whole, or each one of them separately, may form the subject of a separate adherence or of a separate denunciation under the conditions indicated in the present Article and in Article 22.

ARTICLE 17.

Application of International Telegraph Convention of 1875.

The provisions of Articles 1, 2, 3, 5, 6, 7, 8, 11, 12, and 17, of the International Telegraph Convention of St. Petersburg (Petrograd) dated 10/22 July, 1875, shall be applicable to International Radiotelegraphy.

ARTICLE 18.

Arbitration.

In cases of difference of opinion between two or more contracting Governments concerning the interpretation or the execution either of the present Convention or of the Regulations provided for by Article 11, the question at issue may, by mutual consent, be submitted to arbitration. In that event each of the Governments concerned shall choose another not interested in the question.

The decision of the Arbitrators shall be made by an absolute majority of votes.

In the event of an equality of votes, the Arbitrators shall appoint, in order to settle the difficulty, another Contracting Government not concerned in the question in dispute. In default of an agreement with regard to such

choice, each Arbitrator shall propose a Contracting Government not interested in the dispute; and lots shall be drawn as between the Governments proposed. The drawing of lots shall be the prerogative of the Government in whose territory the International Bureau provided for in Article 13 performs its work.

ARTICLE 19.

Legislative Measures.

The High Contracting Parties undertake to adopt or to propose to their respective legislatures the measures necessary to ensure the execution of the present Convention.

ARTICLE 20.

Communication between Contracting Parties.

The High Contracting Powers shall communicate to one another such laws as may have been already enacted or which may be about to be so enacted in their countries, relating to the subject of the present Convention.

ARTICLE 21.

Freedom of Action.

The High Contracting Parties maintain their entire liberty concerning the radiotelegraphic installation not covered by Article 1, and particularly with regard to naval and military installations, and also to stations carrying out communications between fixed points. All such installations and stations shall remain subject solely to the obligations provided for in Articles 8 and 9 of the present Convention.

Nevertheless, when these installations and stations carry out an exchange of maritime public correspondence, they shall conform, in carrying out such service, to the requirements of the Regulations so far as concerns the method of transmission and accounting.

If, on the other hand, coast stations carry out, at the same time as public correspondence with ships at sea, communications between fixed points, they shall not be subject, in the execution of this latter service, to the provisions of the Convention, except as to the observance of Articles 8 and 9 of this Convention.

However, fixed stations which carry out correspondence between land and land must not refuse the exchange of radiotelegrams with another fixed station on account of the system adopted by such station; nevertheless, the liberty of each country shall remain complete in respect of the organisation of the service for correspondence between fixed points and the decision as to the correspondence to be carried out by the stations appropriated to such service.

ARTICLE 22.

Date of Operation.

The present Convention shall come into execution on and from the 1st July, 1913, and shall remain in force for an indeterminable period and until the expiry of one year from the day upon which it is denounced.

Denunciation shall only take effect as regards the Government in whose name it is made. So far as the other Contracting Parties are concerned, the convention shall remain in force.

ARTICLE 23.

Ratification.

The present Convention shall be ratified, and the ratification thereof shall be deposited in London with as little delay as possible.

If one or more of the High Contracting Parties shall not ratify the Convention, it shall not be less valid thereby for the parties which have ratified it.

In witness whereof the respective Plenipotentiaries have signed the Convention in a single copy, which shall remain deposited in the archives of the British Government, and of which a copy shall be sent to each Party.

London, the 5th of July, 1922.

FINAL PROTOCOL

At the time of proceeding to the signature of the Convention adopted by the International Radiotelegraphic Conference of London, the undersigned Plenipotentiaries have agreed as follows:—

I.

The exact nature of the adherence notified on the part of Bosnia-Herzegovina not being yet determined, it is recognised that Bosnia-Herzegovina is entitled to a vote, a decision at a later date being necessary on the question whether this vote belongs to Bosnia-Herzegovina in virtue of the second paragraph of Article 12 of the Convention, or whether this vote is accorded to it conformably to the provisions of the third paragraph of that Article.

II.

The following declaration is placed on record:—

The Delegation of the United States declares that its Government is under the necessity of abstaining from all action with regard to tariffs, because the transmission of radiotelegrams as well as of telegrams in the United States is undertaken, wholly or in part, by commercial or private companies.

III.

The following declaration was also placed on record:—

The Government of Canada reserves to itself the right to fix separately, for each of its coast stations, a total sea charge for radiotelegrams originating from North America and intended for any ship whatever, the coast charge amounting to three-fifths and the ship charge to two-fifths of such total charge.

In witness whereof the respective Plenipotentiaries have drawn up the present Final Protocol, which shall have the same force and the same validity as if the provisions thereof had been inserted in the text itself of the Convention to which it belongs, and they have signed it in a single copy which shall remain deposited in the archives of the British Government, and of which a copy shall be sent to each party.

London, the 5th of July, 1912.

SERVICE REGULATIONS ANNEXED TO THE INTERNATIONAL RADIOTELEGRAPHIC CONVENTION

CONTENTS.

1. Organisation of radiotelegraphic stations.
2. Hours of service of stations.
3. Form and acceptance of radiotelegrams.
4. Charges.
5. Collection of charges.
6. Transmission of radiotelegrams:—
 - (a) Signals of transmission.
 - (b) Order of transmission.
 - (c) Calling of stations and transmission of radiotelegrams.
 - (d) Acknowledgment of receipt and end of work.
 - (e) Route to be followed by radiotelegrams.
7. Delivery of radiotelegrams.
8. Special radiotelegrams.
9. Records.
10. Refunds and reimbursements.
11. Accounting.
12. International Bureau.
13. Meteorological, time, and other transmissions.
14. Miscellaneous provisions.

I.—ORGANISATION OF RADIO- TELEGRAPHIC STATIONS

I.

Choice of Apparatus.

The choice of radiotelegraphic apparatus and devices to be used by coast stations and ship stations is free. The installation of these stations must, as far as possible, be in keeping with scientific and technical progress.

II.

Wavelength.

Two wavelengths, one of 600 and the other of 300 metres, shall be admitted for the service of general public correspondence. Every coast station open to this service must be equipped in such a way as to be able to use these two wavelengths, of which one shall be designated as the normal wavelength of a station. During the whole time that it is open

every coast station must be in a position to receive calls made by means of its normal wavelength. Nevertheless, for the correspondence covered by paragraph 2 of Regulation XXXV, use shall be made of a wavelength of 1,800 metres. Further, each Government may authorise the use, in a coast station, of other wavelengths for the purpose of securing a long-range service or a service other than that of general public correspondence, and established in conformity with the provisions of the Convention, with the reservation that the wavelengths do not exceed 600 metres, or that they do exceed 1,600 metres.

In particular, stations used exclusively for the despatch of signals intended to determine the position of ships must not use wavelengths exceeding 150 metres.

III.

Equipment.

1. Every ship station must be equipped in such a way as to be able to use the wavelengths of 600 metres and of 300 metres. The first shall be the normal wavelength, and may not be exceeded in transmission, the case of Regulation XXXV (paragraph 2) excepted.

Use may be made of other wavelengths not exceeding 600 metres in special cases, and subject to the approval of the Administrations to which the coast stations and ship stations concerned are subject.

2. During the whole time that it is open every ship station must be able to receive calls made by means of its normal wavelength.

3. Ships of small tonnage, in the case of which it would be materially impossible to use the wavelength of 600 metres for transmission, may be authorised to employ exclusively the wavelength of 300 metres; they must be able to receive by means of the wavelength of 600 metres.

IV.

Communication.

Communications between a coast station and a ship station, or between two ship stations, must be exchanged on both sides by means of the same wavelength. If, in a particular case, communication is difficult, the two stations may, by mutual consent, pass from the wavelength by means of which they are communicating to the other regulation wavelength. Both stations shall resume their normal wavelengths when the radiotelegraphic exchange is finished.

V.

Map and Nomenclature.

1. The International Bureau shall prepare, publish and revise periodically an official map showing the coast stations, their normal ranges, the principal lines of navigation, and the time normally taken by ships for the voyage between the various ports of call.

2. It shall draw up and publish a Nomenclature of the radiotelegraphic stations covered by Article 1 of the Convention, and also periodical supplements for additions and modifications. This Nomenclature shall give, in the case of each station, the following information:—

1st.—For coast stations: the name, nationality, and geographical position indicated by the territorial subdivision and by the longitude and latitude of the place; for ship stations: the name and nationality of the ships; when the case arises, the name and address of the contractor.

2nd.—The call signal. (The call signals must be differentiated from one another, and each one must consist of a group of three letters.)

3rd.—The normal range.

4th.—The radiotelegraphic system with the characteristics of the system of discharge (musical sparks, tone expressed by the number of double vibrations, etc.).

5th.—The wavelengths used (the normal wavelength to be underlined.)

6th.—The nature of the services performed.

7th.—The hours of working.

8th.—When necessary the hour and method of despatch of time signals and meteorological telegrams.

9th.—The coast or ship charge.

3. There shall also be included in the Nomenclature such information relating to radiotelegraphic stations other than those covered by Article 1 of the Convention, as shall be communicated to the International Bureau by the Administrations to which such stations are subject, provided that these are either Administrations which are parties to the Convention, or, if they are not parties to it, have made the declaration provided for in Regulation XLVIII.

4. The following notations shall be adopted in documents for the use of the international service to designate radiotelegraph stations:—

PG—Station open for general public correspondence.

PR—Station open for restricted public correspondence.

P—Private station.

O—Station open only for official correspondence.

N—Station always open.

X—Station not having fixed working hours.

5. The name of a ship station indicated in the first column of the Nomenclature must be followed, when there is duplication of the name, by the call signal of such station.

VI.

Experiments and Practice.

The exchange of unnecessary signals and words is forbidden to the stations covered by Article 1 of the Convention. Experiments and practice shall not be allowed in these stations, except so far as they do not disturb the service of other stations.

Practice must be carried out with wavelengths different from those allowed for public correspondence, and with the minimum of power necessary.

VII.

Compulsory Conditions.

1. All stations are bound to exchange traffic with the minimum of energy necessary to ensure good communication.

2. Every coast and ship station must comply with the following conditions:—

(a) The waves emitted must be as pure and as little damped as possible.

In particular, the use of transmitting devices in which the production of the waves emitted is obtained by discharging the aerial direct by sparks (plain aerial) shall not be allowed except in cases of distress.

It may, however, be allowed in the case of certain special stations (for example, those of small ships) in which the primary power does not exceed 50 watts.

(b) The apparatus must be capable of transmitting and receiving at a speed at least equal

to 20 words per minute, the word being reckoned at the rate of five letters.

New installations bringing into play an energy of more than 50 watts shall be equipped in such a way that it may be possible to obtain easily several ranges less than the normal range, the shortest being of approximately 15 nautical miles. Installations already established bringing into play an energy of more than 50 watts shall be transformed as far as possible in such a manner as to satisfy the foregoing requirements.

(c) Receiving apparatus must allow of receiving, with the greatest possible amount of protection from disturbance, transmissions made with the wavelengths specified in present Regulations, up to 600 metres.

3. Stations serving solely for determining the position of ships (*radiophares*) must not operate over an area of greater radius than 30 nautical miles.

VIII.

Power.

Independently of the general conditions specified in Regulation VII, ship stations must also satisfy the following conditions:—

(a) The power transmitted to the radiotelegraphic apparatus, measured at the terminals of the generator of the station, must not under normal circumstances exceed one kilowatt.

(b) Subject to the provisions of Regulation XXXV, par. 2, a power exceeding one kilowatt may be used if the ship is under the necessity of corresponding at a distance of more than 200 nautical miles from the nearest coast station, or if, in consequence of exceptional circumstances, communication cannot be realised except by means of an increase of power.

IX.

Licences.

1. No ship station may be established or worked by private enterprise without a licence issued by the Government to which the ship is subject.

Stations on board ship having their port of register in a colony, possession, or protectorate may be described as being subject to the authority of such colony, possession, or protectorate.

2. Every ship station holding a licence issued by one of the contracting Governments must be regarded by the other Governments as having an installation fulfilling the conditions imposed by the present Regulations.

The competent authorities of the countries where the ship calls may demand the production of the licence. In default of such production, these authorities may ascertain whether the radiotelegraph installations of the ship satisfy the conditions imposed by the present Regulations.

When an Administration has practical evidence that a ship station is not fulfilling these conditions, it must, in every case, address a complaint to the Administration of the country to which the ship is subject. From that point onwards the procedure shall be, when necessary, as provided in Regulation XII, paragraph 2.

X.

Certificates.

1. The service of the ship station must be carried out by a telegraphist holding a certificate issued by the Government to which the

ship is subject, or, in an emergency and for one voyage only, by another Government party to the convention.

2. There shall be two classes of certificates:—

The first-class certificate shall state the professional qualifications of the operator with regard to:—

(a) the adjustment of the apparatus and knowledge of their working;

(b) transmitting and receiving by ear, at a speed which must not be less than 20 words per minute;

(c) knowledge of the regulations applying to the exchange of radiotelegraphic communications.

The second-class certificate may be issued to a telegraphist who only attains to a speed in transmitting and receiving of 12 to 19 words per minute, but who fulfils the other conditions mentioned above. Telegraphists holding a second-class certificate may be allowed:—

(a) on ships only using radiotelegraphy for their own service and for the correspondence of the ship's company, in particular on fishing vessels;

(b) on all ships as substitutes, provided that such ships have on board at least one operator holding a first-class certificate. Nevertheless, on ships placed in the first class indicated in Regulation XIII, the service must be carried out by at least two telegraphists holding first-class certificates.

In ship stations, transmissions may only be made by a telegraphist holding a first or second-class certificate, an exception being made in cases of emergency, in which it would be impossible to conform to this provision.

3. Further, the certificate shall testify that the Government has placed the telegraphist under the obligation of preserving the secrecy of correspondence.

4. The radiotelegraph service of the ship station shall be placed under the supreme authority of the captain of the ship.

XI.

Emergency Equipment.

Ships provided with radiotelegraph installations and placed in the first two classes indicated in Regulation XIII shall be bound to have emergency radiotelegraph installations of which all the parts shall be placed in conditions of the greatest safety possible, such conditions to be determined by the Government which issues the licence. These emergency installations must have at command a source of power of their own, must be capable of being set working speedily, must be able to work for six hours at least, and must have a minimum range of 80 nautical miles in the case of ships in the first class, and of 50 miles in the case of those of the second class. This emergency installation shall not be required in the case of ships whose ordinary installation fulfils the conditions of the present article.

XII.

Responsibility for Breach of the Convention.

1. If an Administration has information of a breach of the Convention or of the Regulations committed in one of the stations which it has authorised, it shall ascertain the facts and fix the responsibility.

In the case of ship stations, if the responsibility rests on the operator, the Administration shall take the necessary steps, and, if necessary, shall withdraw the certificate. If it is shown that the breach was due to the condition of the

apparatus or to instructions given to the telegraphist, the same procedure shall be followed in respect of the licence issued to the ship.

2. In the event of repeated breaches by the same ship, if the representations made to the Administration to which the ship is subject, by another Administration, remain without effect, the latter shall have the right, after notice given, of authorising its coast stations not to accept communications coming from the ship in question. In case of a difference between the two Administrations the questions shall be submitted to arbitration on the request of one of the Governments concerned. The procedure is indicated in Article XVIII of the Convention.

II.—HOURS OF SERVICE OF STATIONS.

XIII.

Land and Ship Stations.

(a) *Coast Stations.*

1. The service of coast stations shall be, as far as possible, permanent, day and night, without interruptions.

Nevertheless, certain coast stations may have a service of limited duration. Each Administration shall fix the hours of service.

2. Coast stations whose service is not permanent may not close before having transmitted all their radiotelegrams to the ships which are in their radius of action nor before having received from such ships all the radiotelegrams of which notice has been given. This provision shall also apply when ships notify their presence before work has actually ceased.

(b) *Ship Stations.*

3. Ship stations shall be placed in three classes:—

(1st) Stations always open;

(2nd) Stations having limited working hours.

(3rd) Stations having no fixed working hours.

During navigation, the following must remain permanently on the watch: (1st) ships of the first class; (2nd) those of the second class, during the hours that they are open for service; out of these hours, the latter stations must remain on the watch for the first 10 minutes of each hour. The stations of the third class are not bound to perform any regular "listening" service.

It shall fall to the Governments which issue the licences specified in Article IX to fix the class in which the ship is to be placed, in respect of its obligations in the matter of keeping watch. This classification shall be mentioned in the licence.

III.—DRAWING UP AND HANDING IN OF RADIO-TELEGRAMS.

XIV.

Transmission from Ship to Land.

1. Radiotelegrams shall bear, as the first word of the preamble, the service instructions "radio."

2. In the transmission of radiotelegrams coming from a ship at sea, the date and the hour of the handing in at the ship station shall be indicated in the preamble.

3. On forwarding over the telegraph system, the coast station shall insert as the indication

of the office of origin, the name of the ship of origin as it appears in the Nomenclature, and also, when the case arises, that of the last ship which served as an intermediary. These particulars shall be followed by the name of the coast station.

XV.

Transmission from Land to Ship.

1. The address of radiotelegrams intended for ships must be as complete as possible. It shall be compulsorily drawn up as follows:—

(a) Name or title of the addressee, with supplementary particulars if necessary.

(b) Name of the ship, as it appears in the first column of the nomenclature.

(c) Name of the coast station, as it appears in the nomenclature.

Nevertheless the name of the ship may be replaced, at the risks and perils of the sender, by the particulars of the voyage taken by such ship and determined by the names of the ports of origin and destination or by any other equivalent particulars.

2. In the address, the name of the ship, as it appears in the first column of the nomenclature, shall be counted in every case, and independently of its length, as one word.

3. Radiotelegrams drawn up by means of the International Signal Code shall be forwarded to their destination without being de-coded.

IV.—CHARGES.

XVI.

Coast and Ship Charges.

1. The coast charge and the ship charge shall be fixed in accordance with the tariff per word pure and simple, on the basis of a fair remuneration for radiotelegraphic work, with optional application of a minimum charge per radiotelegram.

The coast charge may not exceed 60 centimes per word, nor the ship charge 40 centimes per word. Nevertheless each Administration shall have the right to authorise coast and ship charges higher than these maxima in the case of stations having a range of more than 400 nautical miles, or of stations exceptionally onerous on account of the material conditions of their installation or working.

The optional minimum charge per radio telegram may not exceed the coast or ship charge for a radiotelegram of 10 words.

2. In the case of radiotelegrams originating from or intended for a country or exchanged directly with the coast stations of that country, the charge applying to the transmission over the lines of the telegraph system must not exceed, on the average, that of the inland rate of that country.

This charge shall be reckoned per word pure and simple, with an optional minimum charge not exceeding the charge for 10 words. It shall be notified in francs by the Administration of the country to which the coast station is subject.

In the case of countries in the European system, with the exception of Russia and Turkey, there shall only be a single charge for the territory of each country.

XVII.

Retransmission.

1. When a radiotelegram originating from a ship and intended for *terra firma* passes through one or more ship stations, the charge shall include, in addition to those of the ship of

origin, the coast station, and the telegraph system, the ship charge of each of the ships taking part in the transmission.

2. The sender of a radiotelegram originating from *terra firma* and intended for a ship may require that his message be transmitted by way of one or two ship stations; he shall deposit for this purpose the amount of the radiotelegraphic and telegraphic charges, and besides, as a deposit, a sum to be fixed by the office of origin with a view to the payment to the intermediate ship stations of the transit charges fixed in paragraph 1; he must further pay, as he may choose, either the charge for a telegram of five words or the cost of postage of a letter to be sent by the coast station to the office of origin giving the information necessary to the liquidation of the sum deposited.

The radiotelegram shall then be accepted at the risks and perils of the sender; it shall bear before the address the paid additional particulars "x retransmission telegraphie" or "x retransmission lettre" (x representing the number of retransmissions required by the sender) accordingly as the sender desires that the information necessary for the liquidation of the deposit be furnished by telegram or by letter.

3. The charge for radiotelegrams originating from a ship, intended for another ship, and sent by way of one or two intermediate coast stations, shall include:—

The ship charges of both ships, the charge of the coast station or the two coast stations, as the case may be, and when necessary the telegraph charge appropriate to the transit between the two coast stations.

4. The charge for radiotelegrams exchanged between ships without the aid of a coast station includes the ship charges of the ship of origin and of the ship of destination, with the ship charges of the intermediate stations added thereto.

5. The coast and ship charged due to the stations of transit shall be the same as those fixed for such stations when these are stations of origin and destination. In no case shall they be collected more than once.

6. In the case of any intermediate coast station, the charge to be collected for the transit service shall be the highest of the coast charges appertaining to the direct exchange with the two ships in question.

XVIII.

Origin of Telegrams.

The country in whose territory is established a coast station acting as intermediary for the exchange of radiotelegrams between a ship station and another country shall be regarded, for the purpose of applying telegraphic charges, as the country of origin or of destination of such radiotelegrams and not as the country of transit.

V.—COLLECTION OF CHARGES.

XIX.

Tariffs.

1. The total charge for radiotelegrams shall be collected from the sender, with the exception—1st, of the cost of express delivery (Article LVIII, paragraph 1, of the Telegraph Regulations); 2nd, of the charges applying to inadmissible joinings or alterations of words noted by the office or station of destination

(Article XIX, paragraph 9, of the Telegraph Regulations), these charges being collected from the addressee.

Ship stations must possess the necessary tariffs for this purpose. They shall have, however, the right to obtain information from coast stations with regard to charges for radiotelegrams for which they do not possess all the necessary information.

2. The counting of words by the office of origin shall be decisive in the case of radiotelegrams addressed to ships, and that of the ship station of origin shall be decisive in the case of radiotelegrams originating in ships, both for the purpose of transmission and for that of the international accounts. Nevertheless when the radiotelegram is worded wholly or in part either in one of the languages of the country of destination, in the case of radiotelegrams originating in ships, or in one of the languages of the country to which the ship belongs, in the case of radiotelegrams addressed to ships, and when the radiotelegram contains joinings or alterations of words contrary to the common use of that language, the office or ship station of destination, as the case may be, shall have the right to recover from the addressee the amount of the charge not collected. In the case of a refusal to pay the radiotelegram may be withheld.

VI.—TRANSMISSION OF RADIOTELEGRAMS.

(A) SIGNALS OF TRANSMISSION.

XX.

Code.

The signals employed shall be those of the International Morse Code.

XXI.

Distress Signals.

Ships in distress shall make use of the following signal.

• • • — — — • • •

repeated at short intervals, followed by the necessary particulars.

As soon as a station hears the signal of distress, it must suspend all correspondence and must not resume the same until after it has made sure that the communication consequent upon the call for help is finished.

The stations that hear a call of distress must act according to indication given by the ship which makes the call, with regard to the order of messages or their cessation.

When, at the end of a series of distress calls, there is added the call signal of the particular station, the reply to the call is proper to that station only, unless that station does not reply. Failing the indication of a particular station in the call for help, every station that hears the call shall be bound to reply thereto.

XXII.

Information.

For the purpose of giving or asking information concerning the radiotelegraph service, stations must make use of the signals contained in the list appended to the present Regulations. (See p. 30.)

(B) ORDER OF TRANSMISSION.

XXIII.

Duration of Transmission.

Between two stations, radiotelegrams of the same class shall be transmitted singly in

alternate order or by series of several radiotelegrams, according to the instructions given by the coast station, on condition that the duration of the transmission of each series does not exceed 15 minutes.

(C) CALLING OF STATIONS AND TRANSMISSION OF RADIOTELEGRAMS.

XXIV.

Calls.

1. As a general rule, it shall be the ship station that calls the coast station, whether it has radiotelegrams to transmit or not.

2. In waters where the radiotelegraphic traffic is congested (the Channel, etc.), the call of a ship to a coast station may not, as a general rule, be made unless the latter is within the normal range of the ship station and the ship station has approached to a distance less than 75 per cent. of the normal range of the coast station.

3. Before proceeding to make a call, the coast station or the ship station must adjust its receiving system to the highest possible degree of sensitiveness, and must make sure that no other communication is being made within its radius of action; if it is otherwise, it shall await the first break, unless it finds that its call is not likely to disturb the communication in progress. The same applies when the station wishes to answer a call.

4. For making a call every station shall use the normal wave of the station to be called.

5. If, in spite of these precautions, a radiotelegraphic transmission be impeded, the call must cease on the first request made by a coast station open to public correspondence. This station must then indicate the approximate duration of the wait.

6. The ship station must make known to each coast station to which it has notified its presence the time at which it proposes to cease its operations, and also the probable duration of the interruption.

XXV.

Call Signals.

1. The call comprises the signal — • — • —, the call signal of the station called, sent three times, and the word "de," followed by the call signal of the sending station, sent three times.

2. The station called shall reply by giving the signal — • — • —, followed by the call signal sent three times, of the calling station by the word "de," its own call signal and the signal — • —.

3. Stations who wish to enter into communication with ships, without, however, knowing the names of those ships which are within their radius of action, may use the signal — • — • — • — (signal of enquiry). The provisions of paragraphs 1 and 2 are also applicable to the transmission of the signal of enquiry and to the reply to that signal.

XXVI.

Station Failing to Reply.

If a station when called does not reply when the call (Regulation XXV) has been sent three times at intervals of 2 minutes, the call may not be resumed until after an interval of 15 minutes, the station making the call first making sure of the fact that no radiotelegraphic communication is in progress.

XXVII.

Use of High Power.

Every station which has to make a transmission necessitating the use of high power shall first send out three times the warning

signal — • — • —, with the minimum of power necessary to reach the neighbouring stations. It shall not then begin to transmit with the high power until 30 seconds after sending the warning signal.

XXVIII.

Particulars regarding Reception.

1. As soon as the coast station has replied, the ship station shall furnish it with the following information if it has messages to transmit to it; this information shall also be given when the coast stations ask for it:—

(a) The approximate distance, in nautical miles, of the vessel from the coast station;

(b) The position of the ship given in a concise form and adapted to the circumstances of the individual case;

(c) The next port at which the ship will touch;

(d) The number of radiotelegrams if they are of normal length or the number of words if the messages are of exceptional length.

The speed of the ship in nautical miles shall be given specially at the express request of the coast station.

2. The coast station shall reply giving, as provided in paragraph 1, either the number of telegrams or the number of words to be transmitted to the ship and also the order of transmission.

3. If transmission cannot take place immediately the coast station shall inform the ship station of the approximate length of the wait.

4. If a ship station when called cannot receive for the moment it shall inform the calling station of the approximate length of the wait.

5. In the case of exchanges between two ship stations it shall rest with the station called to fix the order of transmission.

XXIX.

Exchange of Messages.

When a coast station is called by several ship stations, it shall decide the order in which these stations shall be allowed to exchange their messages.

In the regulation of this order, the coast station shall be guided solely by the necessity for allowing every station concerned to exchange the greatest possible number of radiotelegrams.

XXX.

Order of Transmission.

Before beginning to exchange correspondence the coast station shall inform the ship station whether the transmission is to be made in alternate order by series (Regulation XXIII); it shall then begin to transmit, or shall follow up these instructions by the signal — • —.

XXXI.

Initial and Final Signals.

The transmission of a radiotelegram shall be preceded by the signal — • — • — and ended by the signal • — • — followed by the call signal of the sending station and by the signal — • —.

In the case of a series of radiotelegrams, the call-letter of the sending station and the signal — • — shall only be given at the end of the series.

XXXII.

Lengthy Messages.

When the radiotelegram to be transmitted contains more than 40 words, the sending

station shall interrupt the transmission by the signal • • — • • after each series of 20 words or thereabouts, and it shall not resume transmission until after having obtained from the station in correspondence the repetition of the last word clearly received, followed by the said signal, or, if the reception is clear, the signal — • •

In the case of transmission in series, the acknowledgment of receipt shall be given after each radiotelegram.

Coast stations engaged in transmitting long radiotelegrams must suspend transmission at the end of each period of 15 minutes, and must remain silent during a period of 3 minutes before continuing transmission.

Coast and ship stations which work in the conditions laid down in Regulation XXXV, paragraph 2, must suspend work at the end of each period of 15 minutes, and keep watch on the wavelength of 600 metres during a period of 3 minutes before continuing transmission.

XXXIII.

Doubtful Messages.

1. When the signals become doubtful, all possible resources must be drawn upon to accomplish transmission. To this end, the radiotelegram shall be transmitted three times at most, at the request of the receiving station. If in spite of this triple transmission the signals are still unintelligible, the radiotelegram shall be cancelled.

If the acknowledgment of receipt does not come to hand, the sending station shall again call the station with which it is in correspondence. When no reply is made after three calls, the transmission shall not be persevered with. In such case, the sending station shall have the right to obtain the acknowledgment of receipt through the medium of another radiotelegraph station, using, when necessary, the lines of the telegraph system.

2. If the receiving station considers that, in spite of defective receiving, the radiotelegram can be delivered, it shall insert at the end of the preamble the service advice "Reception douteuse," and shall forward the radiotelegram. In such case, the Administration to which the coast station is subject shall claim the charges, in conformity with Clause XLII of the present Regulations. Nevertheless, if the ship station later on transmits the radiotelegram to another coast station of the same Administration, the latter can only claim the charges appertaining to a single transmission.

(D) ACKNOWLEDGMENT OF RECEIPT AND END OF WORK.

XXXIV.

Acknowledgment of Reception and Completion.

1. The acknowledgment of receipt shall be given in the form prescribed by the International Telegraph Regulations; it shall be preceded by the call signal of the sending station and followed by the call signal of the receiving station.

2. The end of the work between two stations shall be indicated by each one of them by means of the signal • • • — • • followed by its own call signal.

(E) ROUTE TO BE TAKEN BY RADIO-TELEGRAMS.

XXXV.

Route of Transmission.

1. As a general principle, the ship station shall transmit its radiotelegrams to the nearest coast station.

However, if the ship station has the choice between several coast stations at equal or nearly equal distances, it shall give the preference to that which is established on the territory of the country of destination or of normal transit of its radiotelegrams.

2. Nevertheless, a sender on board a ship shall have the right to indicate the coast station by which he wishes his radiogram to be forwarded. The ship station shall then wait until this coast station is the nearest.

Exceptionally, transmission may be made to a more distant coast station, provided:—

(a) That the radiotelegram is intended for the country in which such coast station is situated and that it comes from a ship subject to that country;

(b) That for calls and transmission both stations use a wavelength of 1,800 metres;

(c) That transmission by this wavelength does not disturb any transmission made, by means of the same wavelength, by a nearer coast station;

(d) That the ship station is more than 50 nautical miles distant from any coast station shown in the nomenclature. The distance of 50 miles may be reduced to 25 miles, subject to the reservation that the maximum power at the terminals of the generator do not exceed 5 kilowatts and that the ship stations be established in conformity with Regulations VII and VIII. The reduction of distance shall not apply in the seas, bays, or gulfs of which the shores belong to one country only, and of which the opening to the high sea is less than 100 miles wide.

VII.—DELIVERY OF RADIO-TELEGRAMS.

XXXVI.

Delivery.

When for any cause whatsoever a radiotelegram coming from a ship at sea and intended for *terra firma* cannot be delivered to the addressee, an advice of non-delivery shall be sent out. This advice shall be transmitted to the coast station which received the original radiotelegram. The latter, after verifying the address, shall forward the advice to the ship, if possible, and, if need be, by way of another coast station of the same country or of a neighbouring country.

When a radiotelegram, having arrived at the ship station, cannot be delivered, that station shall inform the office or ship station of origin by means of a service advice. In the case of radiotelegrams coming from *terra firma* this advice shall be transmitted, whenever possible, to the coast station by way of which the radiotelegram passed, or, if necessary, to another coast station of the same country or of a neighbouring country.

XXXVII.

Non-delivery.

If the ship to which the radiotelegram is addressed has not notified its presence to the coast station within the time specified by the sender, or, in the absence of such specification up to the morning of the eighth day following, such coast station shall give notice of the fact to the office of origin, which shall inform the sender of the same.

This latter shall have the option of requiring by paid service advice, telegraphic or postal, addressed to the coast station, that his radiotelegram be kept for a fresh period of nine days

for transmission to the ship, and so on. In the absence of such request the radiotelegram shall be returned as undelivered at the end of the ninth day (the day of handing in not to be included).

However, if the coast station is sure that the ship has left its radius of action before the station could have transmitted the radiotelegram to it, such station shall immediately inform the office of origin, which shall without delay advise the sender of the cancellation of the message. Nevertheless, the sender may, by paid service advice, request the coast station to transmit the radiotelegram when the ship next passes.

VIII.—SPECIAL RADIOTELEGRAMS.

XXXVIII.

Special Messages.

The following only shall be allowed :—

1st, *Reply Paid Radiotelegrams.*—These radiotelegrams shall bear, before the address, the indication, “Réponse payée,” or “RP.” completed by the mention of the amount paid in advance for the reply—for example : “Réponse payée fr. x,” or “Rp. fr. x.”

The reply voucher issued on board a ship shall give the right to send, up to the limit of its value, a radiotelegram to any address whatever from the ship station which issues such voucher.

2nd, *Collated Radiotelegrams.*

3rd, *Express Delivery Radiotelegrams.*—But only in cases in which the amount of the cost of express delivery is collected from the addressee. The countries which cannot adopt these radiotelegrams must notify the fact to the International Bureau. Radiotelegrams for express delivery, with collection of the cost from the sender, may be allowed when they are intended for the country in whose territory the corresponding coast station is situated.

4th, *Radiotelegrams for Delivery by Post.*

5th, *Multiple Radiotelegrams.*

6th, *Radiotelegrams with Acknowledgment of Receipt.*—But only with regard to notification of the date and time at which the coast station has transmitted to the ship station the telegram addressed to the latter.

7th, *Paid Service Advices.*—Except those asking for repetition of information. Nevertheless, all paid service advices shall be allowed on the route over the telegraph lines.

8th, *Urgent Radiotelegrams.*—But only in transmission over the telegraph lines, and subject to the application of the International Telegraph Regulations.

XXXIX.

Postal Radiotelegrams.

Radiotelegrams may be transmitted by a coast station to a ship, or by a ship to another ship, with the object of being forwarded by post, the posting to take place from a port of call of the receiving ship.

The address of these radiotelegrams must be drawn up as follows :—

1st, Paid instruction “poste,” followed by the name of the port where the radiotelegram is to be posted ;

2nd, Full name and address of the addressee ;

3rd, Name of the ship station which is to carry out the posting ;

4th, When necessary, name of the coast station.

Example :—Poste Buenos Aires, Martinez
14 Calle Prat, Valparaiso, Avon Lizard.

The charge shall include, as well as the radiotelegraph and telegraph charges, a sum of 25 centimes for the postage of the radiotelegram.

IX.—ARCHIVES.

XI.

Records.

The originals of radiotelegrams, as well as the documents relating thereto, retained by the Administrations, shall be kept with all necessary precaution in respect of secrecy for at least fifteen months, counting from the month following that in which the radiotelegrams were handed in.

These originals and documents shall be sent, as far as possible, at least once a month by the ship stations to the Administrations to which they are subject.

X.—REFUNDS AND REIMBURSEMENTS.

XLI.

Refund of Charges.

With regard to refunds and reimbursements, the provisions of the International Telegraph Regulations shall apply, bearing in mind the restrictions laid down in Clauses XXXVIII and XXXIX of the present Regulations and subject to the following reservations :—

The time occupied in radiotelegraphic transmission, and also the time during which the radiotelegram remains at the coast station in the case of radiotelegrams addressed to ships, or in the ship station in the case of radiotelegrams originating in ships, shall not be counted in the period of delay giving rise to refunds and reimbursements.

If the coast station informs the office of origin that a radiotelegram cannot be transmitted to the ship to which it is addressed, the Administration of the country of origin shall immediately initiate the reimbursement to the sender of the coast and ship charges in respect of such radiotelegram. In this case, the charges reimbursed shall not appear in the account for which provision is made by Regulation XLII, but the radiotelegram shall be mentioned therein as a memorandum.

Reimbursements shall be borne by the various Administrations and private enterprises which have taken part in the forwarding of the radiotelegram, each one of them relinquishing its share of the charge. Nevertheless, radiotelegrams falling under the provision of Articles VII and VIII of the Convention of St. Petersburg shall remain subject to the provisions of the International Telegraph Regulations, except when it is due to an error of service that such radiotelegrams have been accepted.

When the acknowledgment of receipt of a radiotelegram has not reached the station which transmitted the message, the charge shall not be refunded until it has been proved that the radiotelegram is one which gives occasion for reimbursement.

XI.—ACCOUNTING.

XLII.

Accounts.

1. Coast and ship charges shall not be entered in the accounts provided for by the International Telegraph Regulations.

The accounts relating to these charges shall be settled by the Administrations of the countries concerned. They shall be prepared by the Administrations to which the coast stations belong, and communicated by them to the Administrations concerned. In cases in which the working of the coast stations is independent of the Administration of the country, the person working these stations may be substituted in respect of accounts for the Administration of such country.

2. As to transmission over the lines of the telegraph system the radiotelegram shall be treated in respect of accounts in conformity with the Telegraph Regulations.

3. In the case of radiotelegrams originating from ships the Administration to which the coast station is subject shall debit the Administration to which the ship station of origin is subject with the coast and ordinary telegraph charges, the total charges collected for prepaid replies, the coast and telegraph charges collected for collations, the charges appertaining to express delivery (in the case provided for in Regulation XXXVIII) or delivery by post, and with those collected for supplementary copies (TM). The Administration to which the coast station is subject shall credit, when the case arises, through the channel of the telegraph accounts and through the medium of the offices which have taken part in the transmission of the radiotelegrams, the Administration to which the office of destination is subject with the total charges relating to prepaid replies. With regard to telegraph charges and charges relating to express delivery or delivery by post, and to supplementary copies, the procedure shall be in conformity with the telegraph regulations, the coast station being regarded as the telegraph office of origin.

In the case of radiotelegrams intended for a country lying beyond that to which the coast station belongs, the telegraph charges to be liquidated conformably to the above provisions are those which arise either from tables "A" and "B" appended to the International Telegraph Regulations or from special arrangements concluded between the Administrations of adjoining countries and published by those Administrations and not the charges which might be made under the special provisions of Regulations XXIII (paragraph 1) and XXVII (paragraph 1) of the Telegraph Regulations.

In the case of radiotelegrams and paid-service advices addressed to ships, the Administration to which the office of origin is subject shall be debited directly by that to which the coast station is subject with the coast and ship charges. Nevertheless, the total charges appertaining to prepaid replies shall be credited, if there is occasion, from country to country through the channel of Administration to which the coast station is subject. In respect to the telegraph charges for supplementary copies, the procedure shall be in conformity with the telegraph regulations. The Administration to which the coast station is subject shall credit that to which the ship of destination is subject with the ship charge, if there is occasion, with the charges belonging to the intermediate ship stations, with the total charge collected for prepaid replies, with the ship charge relating to collation, and also with the charges made for preparing supplementary copies and for delivery by post.

The paid service advices, and the prepaid replies themselves, shall be treated, in the radiotelegraphic accounts, in all respects like other radiotelegrams.

In the case of radiotelegrams forwarded by means of one or two intermediate ship stations, each of the latter shall debit that ship station of origin, if the radiotelegram is one coming from a ship, or the ship station of destination if the radiotelegram is one intended for a ship, with the ship charge due to it for transit.

4. In principle the settlement of account appertaining to exchanges between ship stations shall be made directly as between the companies working those stations, the station of origin being debited by the station of destination.

5. The monthly accounts serving as a basis for the special accounting in respect of radiotelegrams shall be drawn up radiotelegram by radiotelegram, with all necessary particulars, and within a period of six months counting from the month to which they belong.

6. The Governments reserve to themselves the option of making between themselves and with private companies (contractors working radiotelegraphic stations, shipping companies, etc.) special arrangements with a view to the adoption of other provisions respecting accounts.

XII.—INTERNATIONAL BUREAU.

XLIII.

Expenses.

The supplementary expenses resulting from the work of the International Bureau in connection with radiotelegraphy must not exceed 80,000 fcs. per annum, not including special expenses to which the meeting of an International Conference gives rise. The Administrations of the contracting States shall be, for the purposes of contribution towards the expenses, divided into six classes as follows:—

1st Class.—Union of South Africa, Germany, United States of America, Alaska, Hawaii, and the other American possessions in Polynesia, the Philippine Islands, Porto Rico and the American possessions in the Antilles, the zone of the Panama Canal, the Argentine Republic, Australia, Austria, Brazil, Canada, France, Great Britain, Hungary, British India, Italy, Japan, New Zealand, Russia, Turkey.

2nd Class.—Spain.

3rd Class.—Russian Central Asia (littoral of the Caspian Sea), Belgium, Chili, Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung, Dutch Indies, Norway, Holland, Portugal, Roumania, Western Siberia (littoral of the Arctic Ocean), Eastern Siberia (littoral of the Pacific Ocean), Sweden.

4th Class.—Ex-German East Africa, Ex-German South-West Africa, The Cameroons, Togoland, Ex-German Pacific Protectorates, Denmark, Egypt, Indo-China, Mexico, Siam, Uruguay.

5th Class.—French West Africa, Bosnia-Herzegovina, Bulgaria, Greece, Madagascar, Tunis.

6th Class.—French Equatorial Africa, Portuguese West Africa, Portuguese East Africa and the Portuguese possessions in Asia, Bokhara, the Belgian Congo, the Colony of

Curaçao, the Spanish Colony of the Gulf of Guinea, Erythrea, Khiva, Morocco, Monaco, Persia, San Marino, Italian Somaliland.

XLIV.

Work of Berne Bureau.

The various Administrations shall forward to the International Bureau a form modelled on that hereto appended (see page 30) and containing the particulars enumerated in the form with regard to the stations covered by Clause V of the Regulations. Any modifications which may take place and additions shall be communicated by the Administrations to the International Bureau from the 1st to the 10th of each month. With the help of these communications the International Bureau will draw up the nomenclature provided for by Regulation V. The nomenclature shall be distributed to the Administrations concerned. It may also, with the supplements relating thereto, be sold to the public at cost price.

The International Bureau shall take care that the adoption of identical call signals for radiotelegraph stations be avoided.

XIII.—METEOROLOGICAL TRANSMISSIONS, TIME SIGNALS, AND OTHER TRANSMISSIONS.

XLV.

Meteorological and other Messages.

1. The Administrations shall take the necessary steps to supply their coast stations with meteorological telegrams containing the particulars of interest to the district of such stations. These telegrams, the text of which must not exceed twenty words, shall be sent to the ships which ask for them. The charge for these meteorological telegrams shall be carried to the account of the ships to which they are addressed.

2. The meteorological observations, made by certain ships appointed for that purpose by the country to which they belong, may be sent once a day as paid service advices to the coast stations authorised to receive them by the Administrations concerned, who shall also appoint the meteorological offices to which these observations shall be addressed by the coast station.

3. Time signals and meteorological telegrams shall be transmitted in succession one to another in such a way that the total duration of their transmission does not exceed ten minutes. In principle, while they are being sent, radiotelegraph stations, transmission by which might disturb the reception of these signals and telegrams, shall keep silent so as to allow all stations which desire to do so to receive these telegrams and signals. Exception shall be made in the case of distress calls and State telegrams.

4. The Administrations shall facilitate the communication to the marine information agencies which they may appoint of the information respecting wrecks and casualties at sea, or presenting a general interest for navigation, which the coast stations can communicate regularly.

XIV.—MISCELLANEOUS PROVISIONS.

XLVI.

Interference.

Transmission exchanged between ship stations must be carried out in such a way as not to interfere with the service of coast stations, as the latter must have, as a general rule, right of priority for public correspondence.

XLVII.

Compulsory Retransmission.

Coast stations and ship stations shall be bound to take part in the retransmission of radiotelegrams in cases in which communication cannot be established directly between the stations of origin and destination.

Nevertheless, the number of transmissions shall be limited to two.

In the case of radiotelegrams intended for *terra firma* use may only be made of retransmissions to reach the nearest coast station.

Retransmission shall be in all cases subject to the condition that the intermediate station which receives the radiotelegram in transit is in a position to send it on.

XLVIII.

Non-Contracting Governments.

If the transmission of a radiotelegram is carried out partly on the telegraph lines or through radiotelegraph stations belonging to a non-contracting Government, such radiotelegram may be sent forward, subject to the reservation that at least the Administrations to which these lines or stations belong shall have declared that they are willing to apply, when the case arises, the provisions of the Convention and of the Regulations, which are indispensable, in order that radiotelegrams may be regularly forwarded, and that accounting may be assured.

Such declaration shall be made to the International Bureau, and brought to the knowledge of the offices of the Telegraph Union.

XLIX.

Operation of Modifications to Regulations.

The modifications of the present Regulations which may be rendered necessary in consequence of the decisions of future Telegraph Conferences shall come into force on the date fixed for the application of the provisions decided upon by each one of these later Conferences.

L.

Application of International Telegraph Regulations.

The provisions of the International Telegraph Regulations shall apply by analogy to radiotelegraph correspondence in so far as they are not contrary to the provisions of the present Regulations.

The following in particular apply to radiotelegraph correspondence:—

The provisions of Article XXVII, paragraphs 3 to 6, of the Telegraph Regulations referring to the collection of charges; those of Articles XXXVI and XLI referring to the indication of the route to be taken; those of Articles LXXV, paragraph 1, LXXVIII, paragraphs 2 to 4, and LXXIX, paragraphs 2

to 4, relating to preparing of accounts. Nevertheless, first, the period of six months provided by paragraph 2 of Article LXXIX of the Telegraph Regulations for the verification of accounts is extended to nine months in the case of radiotelegrams; second, the provisions of Article XVI, paragraph 2, are not considered as authorising the free transmission by radiotelegraph stations of service telegrams relating exclusively to the telegraph service, nor the free transmission over the lines of the telegraph system of service telegrams relating exclusively to the radiotelegraph service; third, the provisions of Article LXXIX, paragraphs 3 and 5, do not apply to radiotelegraph accounting. For the purposes of apply-

ing the provisions of the Telegraph Regulations coast stations shall be regarded as offices of transit, except when the Radiotelegraphic Regulations stipulate expressly that these stations are to be considered as offices of origin or destination.

Conformable to Article II of the Convention of London the present regulations will come into force on July 1st, 1913.

In witness whereof the respective Plenipotentiaries have signed these Regulations on a single copy, which will remain deposited in the Archives of the British Government, and of which a copy will be sent to each party.

APPENDIX

I.

TABLE REFERRED TO IN REGULATION XLIV (p 29).

(a) COAST STATIONS.

Name.	Nationality.	Geographical Position. E = East longitude; O = West longitude; N = North latitude; S = South latitude. Territorial subdivisions.	Call Signal.	Normal Range in Nautical Miles.	Radiotelegraph System, with the characteristics of the System of emission.	Wavelengths in Metres (the normal wavelength is underlined).
Nature of Services effected.	Working hours (Time according to the Meridian).	Coast Charge.		Observations.		
		Per Word in Francs.	Minimum per Radiotelegram in Francs.	(if occasion, Time and Method of sending Time-Signals and Meteorological Telegrams).		

(b) SHIP STATIONS.

Name.	Nationality.	Call Signal.	Normal Range in Nautical Miles.	Radiotelegraph System, with the characteristics of the System of emission.	Wavelengths in Metres.
Nature of Services effected.	Working Hours.	Ship Charge.		Observations.	
		Per Word in Francs.	Minimum per Radiotelegram in Francs.	(if occasion, Name and Address of the person working the Station).	

II.

LIST OF ABBREVIATIONS TO BE USED IN RADIOTELEGRAPH TRANSMISSIONS
(referred to in Article XXII, p. 24).

(The abbreviations are to be found in the Code Section).

INTERNATIONAL CONVENTION

ON

SAFETY OF LIFE AT SEA

London, January 20th, 1914.

THE London International Conference on the Safety of Life at Sea, by which the Convention signed on January 20th, 1914, has been drawn up, met for the first time on November 12th, 1913, at the Foreign Office, London. The suggestion that such a Conference should be held emanated from the ex-German Emperor, and the task of convening it was undertaken by the British Government. The following States were represented: Great Britain, Germany, the United States, Australia, Austria-Hungary, Belgium, Canada, Denmark, Spain, France, Italy, Japan, Norway, the Netherlands, Russia, Sweden, and New Zealand. The delegations from the different States, were composed, not of the representatives of the shipping trade, but of administrators, experts and jurists.

The late Lord Mersey was appointed Chairman of the Conference. To deal with the specific subjects submitted to it the Conference appointed five sub-committees, together with a sixth sub-committee for drafting the Convention, which was to embody the recommendations of the Committees as approved by the whole Conference.

The Convention contains seventy-four articles, of which we present below those articles which govern the use of wireless telegraphy:—

CHAPTER I.

SAFETY OF LIFE AT SEA.

Article 1.—The High Contracting Parties undertake to give effect to the provisions of this Convention, for the purposes of securing safety of life at sea, to promulgate all regulations and to take all steps which may be necessary to give the Convention full and complete effect.

The provisions of this Convention are completed by Regulations which have the same force and take effect at the same time as the Convention. Every reference to the Convention implies at the same time a reference to the Regulations annexed thereto.

CHAPTER II.

SHIPS TO WHICH THIS CONVENTION APPLIES.

Article 2.—Except where otherwise provided by this Convention, the merchant ships of any of the States of the High Contracting Parties, which are mechanically propelled, which carry more than 12 passengers, and which proceed from a port of one of the said States to a port situated outside that State, or conversely, are subject to the provisions of this Convention. Ports situated in the Colonies, Possessions, or Protectorates of the High Contracting Parties are considered to be ports outside the States of the High Contracting Parties.

Persons who are on board by reason of *force majeure* or in consequence of the obligation laid upon the master to carry ship-

wrecked or other persons, are not deemed to be passengers.

Article 3.—There are excepted from this Convention, save in the cases where the Convention otherwise provides, ships making voyages specified in a schedule to be communicated by each High Contracting Party to the British Government at the time of ratifying the Convention.

No schedule may include voyages in the course of which the ships go more than 200 sea miles from the nearest coast.

Each High Contracting Party has the right subsequently to modify its schedule of voyages in conformity with this Article on condition that it notifies the British Government of such modification.

Each High Contracting Party has the right to claim from another Contracting Party the benefit of the privileges of the Convention for all of its ships which are engaged in any one of the voyages mentioned in its own schedule. For this purpose the Party claiming such benefit shall impose on the said ships the obligations prescribed by the Convention in so far as, having regard to the nature of the voyage, these obligations would not be unnecessary or unreasonable.

Article 4.—No ship, not subject to the provisions of the Convention at the time of its departure, can be subjected to the Convention in the course of its voyage if stress of weather or any other cause of *force majeure* compels it to take refuge in a port of one of the States of the High Contracting Parties.

CHAPTER III.

SAFETY OF NAVIGATION.

Article 5.—When the expression "every ship" is used in this chapter and in the corresponding part of the annexed Regulations it includes all merchant ships, whether they are the ships defined in Article 2 or not, which belong to any of the Contracting States.

Article 6.—The High Contracting Parties undertake to take all steps to ensure the destruction of derelicts in the northern part of the Atlantic Ocean east of a line drawn from Cape Sable to a point situated in latitude 34° north and longitude 70° west. Further, they will establish in the North Atlantic with the least possible delay a service for the study and observation of ice conditions and a service of ice patrol. For this purpose:

Two vessels shall be charged with these three services.

During the whole of the ice season they shall be employed in ice patrol.

During the rest of the year the two vessels shall be employed in the study and observation of ice conditions and in the destruction of derelicts; nevertheless the study and observation of ice conditions shall be effectively maintained, in particular from the beginning of February to the opening of the ice season.

While the two vessels are employed in ice patrol the High Contracting Parties, to the extent of their ability and so far as the exigencies of the Naval Service will permit, will send warships or other vessels to destroy any dangerous derelicts, if this destruction is considered necessary at that time.

Article 7.—The Government of the United States is invited to undertake the management of the three services of derelict destruction, study and observation of ice conditions, and ice patrol. The High Contracting Parties which are specially interested in these services, and whose names are given below, undertake to contribute to the expense of establishing and working the said services in the following proportions:—

	Per cent.
Austria-Hungary	2
Belgium	4
Canada	2
Denmark	2
France	15
Germany	15
Great Britain	30
Italy	4
Netherlands	4
Norway	3
Russia	2
Sweden	2
United States of America ..	15

Each of the High Contracting Parties has the right to discontinue its contribution to the expense of working these services after September 1st, 1916. Nevertheless, the High Contracting Party which avails itself of this right will continue responsible for the expenses of working up to the 1st September following the date of denunciation of the Convention on this particular point. To take advantage of the said right, it must give notice to the other Contracting Parties at least six months before the said 1st September; so that, to be free from its obligations on September 1st, 1916, it must give notice on March 1st, 1916, at the latest, and similarly for each subsequent year.

In case the United States Government should not accept the proposal made to them,

or in case one of the High Contracting Parties for any reason, should not assume responsibility for the pecuniary contribution defined above, the High Contracting Parties shall settle the question in accordance with their mutual interests.

The Government of the High Contracting Party which undertakes the management of the service of derelict destruction is invited to devise means of granting, at the expense of this service, to merchant ships, which have contributed in an effective manner to the destruction of ocean derelicts, rewards to be fixed by the Government in accordance with the services rendered.

The High Contracting Parties which contribute to the cost of the three above-mentioned services shall have the right by common consent to make from time to time such alterations in the provisions of this Article and of Article 6 as appear desirable.

Article 8.—The master of every ship which meets with dangerous ice or a dangerous derelict is bound to communicate the information by all the means of communication at his disposal to the ships in the vicinity, and also to the competent authorities at the first point of the coast with which he can communicate.

Every Administration which receives intelligence of dangerous ice or a dangerous derelict shall take all steps which it thinks necessary for bringing the information to the knowledge of those concerned and for communicating it to the other Administrations.

The transmission of the messages respecting ice and derelicts is free of cost to the ships concerned.

It is desirable that the said information should be sent in a uniform manner. For this purpose a code, the use of which is optional, appears in Article I on the Regulations annexed hereto.

Article 9.—The master of every ship fitted with a radiotelegraph installation, on becoming aware of the existence of an imminent and serious danger to navigation, shall report it immediately in the manner prescribed by Article II of the Regulations annexed hereto.

Article 10.—When ice is reported on, or near his course, the master of every ship is bound to proceed at night at a moderate speed, or to alter his course so as to go well clear of the danger zone.

Article 11.—The ships defined by Article 2 shall have on board a Morse signalling lamp of sufficient range.

The use of Morse signals is regulated by the Code appearing in Article III, as well as by Article IV of the Regulations annexed hereto.

Article 12.—The use of the international distress signals for any other purpose than that of signals of distress is prohibited on every ship.

The use of private signals which are liable to be confused with the international distress signals is prohibited on every ship.

Article 13.—The selection of the routes across the North Atlantic in both directions is left to the responsibility of the steamship companies. Nevertheless the High Contracting Parties undertake to impose on these companies the obligation to give public notice of the regular routes which they propose their vessels should follow, and of any changes which they make in them.

The High Contracting Parties undertake further, to use their influence to induce the

owners of all vessels crossing the Atlantic to follow as far as possible the routes adopted by the principal companies.

Article 14.—The High Contracting Parties undertake to use all diligence to obtain from the Governments which are not parties to this Convention their agreement to the revision of the International Regulations for Preventing Collisions at Sea as indicated below :—

(4) The Regulations shall be completed or revised in regard to the following points:

- (1) The second white light.
- (2) The stern light.
- (3) A day signal for motor vessels.
- (4) A sound signal for a vessel towed.
- (5) The prohibition of signals similar to distress signals.

(B) Articles 2, 10, 14, 15, 31 of the said Regulations shall be amended in accordance with the following provisions:

Article 2. The second white mast-head light to be compulsory.

Article 10. A permanent fixed stern light to be compulsory.

Article 14. A special day signal to be compulsory for motor vessels.

Article 15. A special sound signal to be established for use by a vessel in tow, or if the tow is composed of several vessels, by the last vessel of the tow.

Article 31. Article 31 to be modified in the following manner: Add to the lists of both day and night signals the international radiotelegraph distress signal.

Article 15.—The Governments of the High Contracting Parties undertake to maintain, or, if it is necessary, to adopt, measures for the purpose of ensuring that from the point of view of safety of life at sea, the ships defined in Article 2 shall be sufficiently and efficiently manned.

Chapter IV, which contains Articles 16 to 30, refers to construction.

CHAPTER V.

RADIOTELEGRAPHY.

Article 31.—All merchant ships belonging to any of the Contracting States, whether they are propelled by machinery or by sails, and whether they carry passengers or not, shall, when engaged on the voyages specified in Article 2, be fitted with a radiotelegraph installation if they have on board fifty or more persons in all.

Advantage may not be taken of the provisions of Articles 2 and 3 of this Convention to exempt a ship from the requirements of this chapter.

Article 32.—Ships on which the number of persons on board is exceptionally and temporarily increased up to or beyond fifty as the result of *force majeure*, or because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry shipwrecked or other persons, are exempted from the above obligation.

Moreover, the Governments of each of the Contracting States, if they consider that the route and the conditions of the voyage are such as to render a radiotelegraph installation unreasonable or unnecessary, may exempt from the above requirement the following ships :—

- (1) Ships which in the course of their voyage do not go more than 150 sea miles from the nearest coast.
- (2) Ships on which the number of persons

on board is exceptionally or temporarily increased up to or beyond fifty by the carriage of cargo hands or a part of the voyage, provided that the said ships are not going from one Continent to another, and, that, during that part of their voyage, they remain within the limits of latitude 30° N. and 30° S.

(3) Sailing vessels of primitive build, such as *dhows*, *junks*, etc., if it is practically impossible to install a radiotelegraph apparatus.

Article 33.—Ships which, in accordance with Article 31 above, are required to be fitted with a radiotelegraph installation are divided, for the purpose of radiotelegraph service, into three classes, in accordance with the classification established for ship stations in Article XIII (b) of the Regulations annexed to the Radiotelegraph Convention, signed in London on July 5th, 1912, viz :—

First Class.—Ships having a continuous service.

There shall be placed in the First Class ships which are intended to carry twenty-five or more passengers :—

(1) If they have an average speed in service of fifteen knots or more;

(2) If they have an average speed in service of more than thirteen knots, but only subject to the twofold condition that they have on board two hundred persons or more (passengers and crew), and that, in the course of their voyage, they go a distance of more than 500 sea miles between any two consecutive ports. Nevertheless these ships may be placed in the Second Class on condition that they have a continuous watch.

Second Class.—Ships having a service of limited duration.

There shall be placed in the Second Class all ships which are intended to carry twenty-five or more passengers, if they are not, for other reasons, placed in the First Class.

Ships placed in the Second Class must, during navigation, maintain a continuous watch for at least seven hours a day, and a watch of ten minutes at the beginning of every other hour.

Third Class.—Ships which have no fixed periods of service.

All ships which are placed neither in the First nor in the Second Class shall be placed in the Third Class.

The owner of a ship placed in the Second or in the Third Class has the right to require that, if the ship complies with all the requirements for a superior class, a statement to the effect that it belongs to that superior class shall be inserted in the Safety Certificate.

Article 34.—Ships which are required by Article 31 above to be fitted with a radiotelegraph installation shall be required, by the Government of the countries to which they belong, to maintain a continuous watch during navigation as soon as the said Governments consider that it will be of service for the purpose of safety of life at sea.

Meanwhile, the High Contracting Parties undertake to require, from the date of the ratification of the present Convention, subject to the delays specified below, a continuous watch on the following ships :—

- (1) Ships whose average speed in service exceeds thirteen knots, which have on board 200 persons or more, and which, in the course of their voyage, go a distance of more than 500 sea miles between two

consecutive ports, when these ships are placed in the Second Class.

(2) Ships in the Second Class, for the whole of the time during which they are more than 500 sea miles from the nearest coast.

(3) Other ships specified in Article 31, when they are engaged in the Trans-Atlantic trade, or when they are engaged in other trades if their route takes them more than 1,000 sea miles from the nearest coast.

Ships connected with all kinds of fishing business, including whaling, which are required to be fitted with a radiotelegraph installation, shall not be required to maintain a continuous watch.

The continuous watch may be kept by one or more operators, holding certificates in accordance with Article X of the Regulations annexed to the International Radiotelegraph Convention, 1912, together, if necessary, with one or more certificated watchers. Nevertheless, if an efficient automatic calling apparatus is invented, the continuous watch may be maintained by this means by agreement between the Governments of the High Contracting Parties.

By "certificated watcher" is meant any person holding a certificate issued under the authority of the Administration concerned. To obtain this certificate, the applicant must prove that he is capable of receiving and understanding the radiotelegraph distress signal and the safety signal described in the Regulations annexed hereto.

The High Contracting Parties undertake to take steps to ensure that the certificated watchers observe the secrecy of correspondence.

Article 35.—The radiotelegraph installations required by Article 31 above shall be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 sea miles by day under normal conditions and circumstances.

Every ship which is required, in conformity with the provisions of Article 31 above, to be fitted with a radiotelegraph installation, shall, whatever be the class in which it is placed, be provided in accordance with Article XI of the Regulations annexed to the International Radiotelegraph Convention, 1912, with an emergency installation, every part of which is placed in a position of the greatest possible safety to be determined by the Government of the country to which the ship belongs.

In all cases the emergency installation must be placed, in its entirety, in the upper part of the ship, as high as practically possible.

The emergency installation includes, as provided by Article XI of the Regulations annexed to the International Radiotelegraph Convention, 1912, an independent source of energy capable of being put into operation rapidly and of working for at least six hours with a minimum range of eighty sea miles for ships in the First Class and fifty sea miles for ships in the two other classes.

If the normal installation, which, in accordance with this Article, has a range of at least 100 sea miles, satisfies all the conditions prescribed above, an emergency installation is not required.

The licence provided for in Article IX of the Regulations annexed to the International Radiotelegraph Convention, 1912, may not be issued unless the installation complies both with the provisions of that Con-

vention and also with the provisions of this Convention.

Article 36.—The matter governed by the International Radiotelegraph Convention, 1912, and the Regulations annexed thereto, and in particular the radiotelegraph installations on ships, the transmission of messages, and the certificates of the operators, remain and will continue subject to the provisions:

(1) Of that Convention and the Regulations annexed thereto, or of any other instruments which may in the future be substituted therefor;

(2) Of this Convention, in regard to all the points in which it supplements the aforementioned documents.

Article 37.—Every master of a ship who receives a call for assistance from a vessel in distress is bound to proceed to the assistance of the persons in distress.

Every master of a vessel in distress has the right to requisition from among the ships which answer his call for assistance the ship or ships which he considers best able to render him assistance, but he must exercise this right only after consultation, so far as may be possible, with the masters of those ships. Such ships are then bound to comply immediately with the requisition by proceeding with all speed to the assistance of the persons in distress.

The masters of the ships which are required to render assistance are released from this obligation as soon as the master or masters requisitioned have made known that they will comply with the requisition, or as soon as the master of one of the ships which has reached the scene of the casualty has made known to them that their assistance is no longer necessary.

If the master of a ship is unable, or considers it unreasonable or unnecessary, in the special circumstances of the case, to go to the assistance of the vessel in distress, he must immediately inform the master of the vessel in distress accordingly. Moreover, he must enter in his log book the reasons justifying his action.

The above provisions do not prejudice the International Convention for the unification of certain rules with respect to Assistance and Salvage at Sea, signed at Brussels on September 23rd, 1910, and in particular the obligation to render assistance laid down in Article II of that Convention.

Article 38.—The High Contracting Parties undertake to take all steps necessary for giving effect to the provisions of this chapter with the least possible delay. Nevertheless, they may allow:

A delay not exceeding one year, from the date of the ratification of this Convention, for the provision and training of operators and for the installation of the apparatus on ships placed in the First and Second Classes.

A delay not exceeding two years, from the date of the ratification of this Convention, for the provision and training of the operators and watchers on the ships in the Third Class, for the installation of the apparatus on ships in the Third Class and for the establishment of a continuous watch on ships placed in the Second and Third Classes.

Chapter VI refers to Life-saving Appliances and Fire Protection.

REGULATIONS.
SAFETY OF NAVIGATION.

ARTICLE I.

CODE FOR THE TRANSMISSION BY RADIOTELEGRAPHY OF INFORMATION RELATING TO ICE, DERELICTS, AND WEATHER.

Information relating to ice, derelicts and weather codes is to be found in the Scientific Signal Section of this book.

ARTICLE II.

SAFETY SIGNAL.

Information relating to the Safety Signal is to be found in the Scientific Signal Section of this book.

ARTICLE III.

MORSE CODE.

See Code Section of this book for information relating to the Morse Code and Signals.

SAFETY CERTIFICATE.

Radiotelegraph installation :—

	Class and numbers required by Articles 33 and 34 of the said Convention.	Actual class and numbers.
Class of Ship :—	—	—
Number of { Operators of the 1st Class ..	—	—
{ " 2nd " ..	—	—
{ "Certificated" Watchers " ..	—	—

III. That in all other respects the ship complies with the requirements of the said Convention so far as those requirements apply thereto.

This certificate is issued under the authority of the Government. It will remain in force until

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

(Signature)

Issued at the day of

LAWS AND REGULATIONS AFFECTING RADIOTELEGRAPHY AND TELEPHONY.

THE VARIOUS ACTS, DECREES, REGULATIONS, ETC., REFERRED TO IN THE FOLLOWING LAWS ARE ENUMERATED AT THE BEGINNING OF EACH COUNTRY'S LAWS AND DISTINGUISHED BY CAPITAL LETTERS OF THE ALPHABET.

ARGENTINE REPUBLIC

(See Maps 49, 51 and 53.)

ARGENTINE (Republica Argentina) is situated in the southern portion of South America. A Republican Government was constituted in 1853, and the National Constitution elaborated, with modifications introduced in 1860, 1866, and 1898.

CONTROL.

The Radiotelegraphic Law, passed in October, 1914, definitely assigned the direction of wireless telegraphy and the public wireless service to the Ministries of Interior and Marine.

The Ministry of Marine has jurisdiction over zones extending as far as 100 kilometres from the sea coast and the Rio de la Plata and 50 kilometres on each bank of the navigable rivers. The rest of the country is under the jurisdiction of the Ministry of the Interior.

The Public Maritime Wireless Telegraphic Department is controlled by the Chief of the Department of Naval Communications of the Ministry of Marine, who has authority in everything concerning radio communications in the maritime zone. Under the control of the Ministry of Marine there are 21 coast stations. The number of stations is as follows :—

Commercial traffic with ships	..	..	..	..	18
Official naval traffic only..	..	..	..	..	6
Public land correspondence	..	..	..	..	17
Official " "	..	..	..	..	3

The Department of Naval Communications has its own works where the greater part of the apparatus used in the navy is constructed and repaired. These works are also equipped to effect repairs to the wireless telegraphic apparatus of ships calling at Argentine ports.

OFFICERS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Engineer Emilio Mihura ..	Director General of Posts and Telegraphs ..	Buenos Aires
Naval Captain Luis F. Orlandini	Chief of the Department of Naval Communications	Buenos Aires

ORGANISATION.

At Monte Grande, near Buenos Aires, there is a high power station for service between the Argentine and Europe and the United States. It belongs to the "Compania Argentina Transradio Internacional," which may be considered as the amalgamation of the four companies to whom the Government has granted a licence to instal high power stations. The first receiving station of the "Transradio" is at "Villa Elisa," near the City of La Plata.

There are six broadcasting stations of 500 to 1,000 watts in the aerial, and about 400 licences have been granted for amateur transmitting stations for experimental purposes only.

For the purpose of regulating the working of the broadcasting and amateur stations there has been promulgated the decree of May 27th, 1924 (see D), modifying the decree of July 12th, 1917, Part I, Chapter II, Sub-section 2.

The station of Dársena Norte transmits daily to all ships and coast stations a news service, and the time signal, controlled by the Naval Observatory, is broadcast at 1.55 p.m. (G.M.T.)

ADMINISTRATION.

Below are given the laws and regulations in force at the present time :—

A—Law No. 9,127 regarding radiotelegraphy.

B—Regulations made by the Executive Power for Radiotelegraphy. (July, 1917).

C—Decrees of the Executive Power amplifying the regulations (October, 1919).

D—Decrees of the Executive Power regulating Broadcasting Experimental Stations (May, 1924).

LAW.

A LAW NO. 9,127 PASSED BY THE NATIONAL CONGRESS ON SEPTEMBER 16TH, 1913.

ART. 1.—The wireless service within the national territory, and for international communications within a minimum distance of 1,000 kilometres, shall be exclusively under the control of the State.

ART. 2.—The executive shall attend to the erection of wireless stations within the national territory, and shall so select the sites for the coast ones that all ships sailing near our coasts and navigating our rivers may always be in touch with them.

ART. 3.—The sum of \$400,000 national currency are hereby allocated to the above. This amount will be charged to General Expenses.

ART. 4.—The use of wireless apparatus in perfect working order is hereby declared compulsory for all ships calling at the ports of Argentina carrying fifty or more persons on board, counting the passengers and the crew, on and after ninety days have elapsed since the promulgation of this law.

ART. 5.—Wireless apparatus handled by skilled operators must have at all times a transmission power of not less than 200 kilometres for river craft, and not less than 500 kilometres for sea-going vessels.

ART. 6.—No ships will be allowed to leave port until the prescriptions of Arts. 4 and 5 have been complied with, and should the captain or the officer in charge try to elude or contravene this regulation, the superior local marine authority shall impose a fine of from 1,000 to 5,000 pesos. The party so fined can appeal to the federal magistrate of the district where the contravention has been committed. A double fine will be the penalty for a repetition of the offence.

ART. 7.—The Executive will promulgate the regulations in accordance with this law.

ART. 8.—The above Act of Parliament shall be communicated to the Executive.

The above was approved by the Argentine Congress in the city of Buenos Aires on the sixteenth day of September in the year of our Lord nineteen hundred and thirteen

EXECUTIVE DECREE OF JULY 12TH, 1917.

This is divided into two parts. Of these Part I. only is printed.

PART I.

CHAPTER I.

SUB-SECTION I.

B **ART. 1.**—The “General Rules and Regulations for the Radiotelegraphic Service in the Argentine Republic,” as issued by the Secretary-General of the Marine Ministry are hereby approved.

ART. 2.—The following Regulations and Ordinances are hereby repealed :

Regulations for the Radiotelegraphic Stations of the Navy (December 1st, 1906).

Regulations and Plan of Studies for the Radiotelegraphic Staff (November 27th, 1912).

Regulations for the Radiotelegraphic Service (July 5th, 1913).

Regulations for the Radiotelegraphic Service in the Argentine Republic (October 24th, 1914), and every other regulation affecting the Radiotelegraphic Service issued either as General Instructions, Orders of the Day or Circular Letters from the Marine Ministry, as from the year 1906 inclusive to this date.

ART. 3.—The necessary copies of the new Rules, as mentioned in Art. 1 to be printed.

ART. 4.—This decree to be communicated, published, etc.

(Signed) Irigoyen,

F. ALVAREZ DE TOLEDO.

The following are the documents approved by the Executive Decree above quoted :—

SUB-SECTION 2.

ORGANISATION OF THE RADIOTELEGRAPHIC DEPARTMENT.

ART. 1.—The Radiotelegraphic Service constitutes a Department of the General Secretaryship of the Ministry of Marine.

ART. 2.—The following duties correspond to this Department :—

(a) To intervene in everything affecting the military and public radiotelegraphic service depending from the Ministry of Marine and under its inspection and control.

(b) To intervene in the formation of reports and in the claims and suits that may be promoted.

(c) To study and comply with the international laws, regulations, instructions and conventions or pacts that may affect this service.

(d) To work in the reforms tending to improve the service both in connection with technical details and those of a purely disciplinary character.

(e) To intervene in the preparation of instruction plans and the examination of subordinate radiotelegraphists and civil operators, to propose their promotion and to issue the corresponding credentials (*patentes*).

(f) To intervene in the purchase of radiotelegraphic materials, giving advice and reporting on results.

(g) To attend to that part of the correspondence and intercourse with the Berne International Office referring to this service.

ART. 3.—The Radiotelegraphic Service Department will be divided into the following sections:—

(a) Injuries, Correspondence, and Archives.

(b) Technical Inspection and Superintendency.

(c) Shop, Installations, and Repairs.

(d) Test of apparatus and materials.

(e) Accounting.

ART. 4.—The staffs in the land stations and in the floating lighthouses will be as permanent as consistent with the good service. The staffs will in matters affecting discipline, re-examination and licences, be subordinate to the Secretary of the Ministry; but the last-named officer will see that the General Direction of Personnel is kept informed of the changes occurring in this service.

With the General Secretary rests the duty of putting before the General Director of Personnel any changes that may be considered necessary in the radiotelegraphic staffs on board units of the Navy.

CHAPTER II.

REGULATIONS GOVERNING THE RADIOTELEGRAPHIC SERVICE.

SUB-SECTION I.

JURISDICTION OF THE SEVERAL MINISTRIES ACCORDING TO LAW NO. 9127.

ART. 1.—The national territory is hereby divided into two zones for the purposes of jurisdiction and regularisation affecting the service of radiotelegraphic installations. The aforesaid zones are as follows:—

(a) The *Maritime Zone*, which includes all ship stations in the maritime territorial waters and navigable rivers, besides all land stations situated within one hundred kilometres from the sea and River Plate coasts and those situated within fifty kilometres from the banks of any other navigable rivers.

(b) The *Terrestrial Zone*, which includes all other installations on national territory which are not covered by the above.

ART. 2.—(a) The Maritime Zone is under the jurisdiction of the Minister of Marine, who is responsible for the control of the Public Radiotelegraphic Service and who prescribes the rules and regulations for wireless service in this particular zone.

(b) The Minister of Marine shall also undertake the duty of transmitting all information of any nature which may be asked from him by the International Bureau of Berne.

ART. 3.—(a) The Terrestrial Zone is under the jurisdiction of the Minister of the Interior, who controls the Public Radiotelegraphic Service and who prescribes the rules and regulations for wireless in this particular zone.

(b) In special cases when a state of siege is declared, all installations in this zone shall be placed under the control of the War Office.

ART. 4.—Other Executive Offices can order the installation of wireless stations for their exclusive use, but in such cases the working of such installations must be authorised by the Minister exercising control in the respective zones, and the rules and regulations prescribed for the latter must be observed in these particular stations.

ART. 5.—All wireless installations erected in the national territory must observe the international rules and regulations adhered to by the Government of the Republic, and the General Law regulating the Telegraphic Service must be observed in all matters appertaining to the Public Radiotelegraphic Service.

SUB-SECTION 2.

PERMITS FOR THE INSTALLATION OF PRIVATELY OWNED RADIOTELEGRAPHIC STATIONS.

ART. 1.—Law 9127 having been passed with the object of nationalising of the wireless service, the installation of high-powered wireless stations by private individuals or corporations shall only be allowed in the national territory when such installations are destined for inter-continental communication.

ART. 2.—The granting of such concessions as authorised by Art. 1 corresponds to the Minister in whose jurisdiction the new station is to be erected.

ART. 3.—Where the Minister having control over the zone where the wireless installation is to be erected has given his consent, all the rulings of said Ministry, or any other of its decisions regarding the stations directly dependent on the said installation, must be obeyed unquestionably.

ART. 4.—In general it shall be the duty of the Minister of the Interior to negotiate the bases of agreements in course of conclusion with neighbouring countries, and he will communicate with the Minister of Marine the results arrived at in the course of such negotiations, so that the latter may give effect to any such conventions in so far as they affect his department. The Minister of Marine shall have the right of being consulted in the negotiation of the bases for such conventions.

ART. 5.—No radiotelegraphic (transmitting or receiving) station will be erected without obtaining first the necessary licence from the Minister in whose jurisdictional zone the station is to be established.

ART. 6.—To obtain the licence referred to in Art. 5, the installation must fulfil the following requirements:—

(1) The primary transmitting power must not exceed 50 watts.

(2) The wavelength must not exceed 300 metres in the transmitter.

(3) The receiver may be suitable to receive waves of any length, providing that the Executive Government have no objection thereto.

(4) The installation must not be used for any interchange of messages in the public service. It will be devoted to experimenting and only when in the judgment of the Government no harm or disturbance would arise from its use to the nearest national

stations can the installation send or receive special messages.

ART. 7.—Anyone infringing the rules set out in Arts. 5 and 6 will be penalised in accordance with the penalties established in the General Law relating to the National Telegraph Service.

ART. 8.—Private installations authorised in accordance with Art. 6 must be inspected by the official inspectors, who are entitled to all the information and data they may demand. These installations must be registered and the wireless apparatus must be stamped by an inspector. The Minister exercising jurisdiction in the respective zone can order at any time the closing of authorised private wireless installations.

SUB-SECTION 3.

REGULATIONS AFFECTING ALL INSTALLATIONS ON NATIONAL TERRITORY AND ON BOARD SHIPS.

ART. 1.—The power to be used in all installations on land will be limited to that necessary for communication with the nearest stations in the system. Coast installations which must have high power in order to communicate at long distances are excluded from this limitation.

ART. 2. — (a) All installations open to public service must receive all messages sent by stations under the control of any Ministry or by any of the National Telegraph offices, provided that the regulations established by each administration regarding the radiograms which may go over their lines are complied with at the original stations from which the messages are radiated.

(b) Foreign vessels under the flag of a country which has not adhered to the London Convention will be allowed to communicate with Argentine coast and stationary ship stations, provided the agents representing the company owning such foreign ships ask for the extension of this privilege and fulfil all the requirements established by the present Regulations and by the London Radiotelegraphic Convention.

ART. 3.—Radiograms will be transmitted in the order of priority established by the Law on National Telegraphs and the Radiotelegraphic Convention, namely:—

(a) Distress calls have absolute priority upon any other communication; then follow:—

(b) Service notices of whatever origin when referring to "the Safety of Life at Sea" or containing information of an urgent character for navigation.

(c) Messages from the Executive Government.

(d) Service notices from the Radiotelegraphic stations.

(e) Messages from the Ministry of Marine, its dependencies and its fleets.

(f) Service notices from the shipping companies.

(g) Private messages.

ART. 4.—In accordance with Art. 101 of the Law on National Telegraphs, messages belonging to the same category will be transmitted by the station of origin in the order in which they are delivered to this station, and by the relay stations, in the order in which they are received.

ART. 5.—In accordance with Art. 102 of the Law on National Telegraphs, private messages stamped as urgent in the "telegraph" system, should have priority in transmission, even

upon messages of a superior category not stamped as urgent.

ART. 6.—Any radiogram referring to the internal service of a fleet, squadron or division in march, will be considered as urgent and transmitted accordingly.

ART. 7.—Every official unprepaid radiogram or telegram sent by the Marine officers with authority to do it, will be signed with the corresponding telegraphic address, and such messages will be legalised outside their text with the seal and signature of the competent officer on land or on board.

ART. 8.—The following is a list of Marine Officers who are authorised to send unprepaid radiograms and telegrams, according to the Navy Disciplinary Regulations:—

Secretary-General of the Ministry.

Chief of the Radiotelegraphic Department.

Chief of the Hydrography, Lighthouses and Buoys Department.

Inspector of the Marine Ministry's Dependencies in Tierra del Fuego and Cabo Virgenes.

Director-General of Personnel.

Director-General of Material.

Director-General of Administration.

Prefect-General of Ports.

Prefects of Maritime and River Zones.

Director of the Naval School.

Director of the Training School.

Director of the Mechanics School.

Chiefs of Fleets, Divisions, Squadrons, Light Squadrons or Groups.

Chiefs of Staff of Squadrons and Divisions.

Chiefs of Shipyards and Maritime Zones.

Chief of the Aviation Grounds in "Fuente Barragán."

Commanders of Ships.

Commander of the Marine Depot (*Depósito de Marinería*).

Command of Coast Artillery and "Martín García."

Managers of Coast Radiotelegraphic Stations.

Managers of Lighthouses and Director of the "Año Nuevo" Observatory, when addressing the Chief of Hydrography, Lighthouses and Buoys, or the sectional chiefs in his jurisdiction.

Sub-Prefects and their Assistants when addressing the Prefect-General or the jurisdictional Prefect.

The lists of officers belonging to other branches of national service and who have authority to forward unprepaid messages will be communicated to the Radiotelegraphic Offices when necessary.

ART. 9.—The Manager of a station may demand from any sender of a radiogram proof of his identity before transmitting the message, acting in accordance with Arts. 82 and 83 of the Law on National Telegraphs of 1875.

Arts. 10 and 11 relate to the routine work connected with the transmission and reception of radiotelegrams, and follow the regulations prescribed by the International Convention.

ART. 12.—A radiogram must not contain more than 100 words. If the sender needs more words he must divide his communication in as many messages as necessary to comply with the above rule, and these radiograms will be transmitted alternatively with those from other senders presented for the next turn.

Official unprepaid telegrams must not contain more than 50 words.

ART. 13.—(a) Radiotelegraphic messages transmitted, relayed or received will be kept in the utmost secrecy, as well as the note books

traffic sheets, reports and liquidations of accounts. It is forbidden to divulge the contents of communications intercepted during service hours, even if they do not affect the national public service or the naval service.

(b) If an intercepted radiotelegram contains damaging statements affecting national interests on land or at sea, the information must be communicated at once to the superior of the operator picking up the message, and this operator must keep a memorandum of the text and address of the radiogram concerned.

ART. 14.—It is the duty of every radiotelegraphist to communicate without delay to his superior the contents of intercepted radiograms containing excitations to revolt or affecting the safety of the nation. This information must be transmitted by the superior officer to a competent authority.

ART. 15.—Radiotelegraphic communications, like ordinary telegrams, are confidential; therefore, persons not belonging to the staffs shall not be admitted into the stations.

ART. 16.—In cases referring to the Radiotelegraphic service, not covered by these regulations, the international radiotelegraphic conventions and the Law on National Telegraphs will apply. But if a rule or regulation is not found, the case must be submitted in consultation to the nearest (superior) officer or to the Radiotelegraphic Department.

To ensure a good service it is the duty of coast stations to give to ship stations all the information they may require.

ART. 17.—Radiograms will be delivered following the rules contained in Art. 32 of the Law on National Telegraphs.

SUB-SECTION 4.

CHIEF OF THE PUBLIC MARITIME RADIO-TELEGRAPHIC SERVICE.

ART. 1.—The Secretary - General of the Ministry of Marine shall have under his control the Public Radiotelegraphic Maritime Service and his duties will be as follows:—

(a) He shall supervise all coast stations and ship stations after installation, both of national and foreign register, calling at national ports, and shall also supervise all coast stations, as prescribed in Article 2 of Law 9127.

(b) He shall control the service of the said stations and will draft the regulations for same, taking care that the rules herein established and the International Conventions accepted by the National Government are duly fulfilled.

(c) He shall see to it that all regulations concerning rates, discounts and reimbursements, as well as any others that may be later on prescribed by the Post and Telegraph Office regarding the requirements of radiograms relayed to the National Telegraph lines are faithfully complied with.

(d) He shall forward to the Office of Posts and Telegraphs all claims made to the Prefect-General of Ports by Steamship Companies, ship captains or passengers referring to rates, discounts and reimbursements.

(e) He shall issue through the Office of the Prefect-General of Ports the permits for the erection of wireless on board those ships which may have obtained leave to do so in accordance with these Regulations.

(f) He shall issue licences to the wireless telegraphists operating at all stations working within the Maritime Zone, so soon

as the conditions affecting such licences have been fulfilled in accordance with these Regulations.

(g) He shall cancel such licences and permits granted to stations and operators within the Maritime Zone as it may, for a good reason, be found necessary to withdraw.

(h) He shall enforce, through the Office of the Prefect-General of Ports, the payment of all fines imposed on shipping companies or ships, and shall direct the deposit of the said fines in the National Bank to the order of the Director of Posts and Telegraphs.

(i) He shall have it in his power to authorise the installation of wireless by private individuals or corporations within the Maritime Zone in accordance with Chapter II, Sub-section 1, Art. 5.

ART. 2.—The head of the Public Maritime Radiotelegraphic Service shall act jointly with the Director of Posts and Telegraphs in the following matters:—

(a) In all matters referring to wireless stations installed on the Maritime Zone.

(b) In all matters referring to rates, discounts and reimbursements of the Public Radiotelegraphic Maritime Service in order to obtain a monthly settlement of accounts by the shipping companies or ship captains with the Office of Posts and Telegraphs in conformity with the schedules prepared by the latter.

(c) In the investigation of any questions that may arise for consultation from the Wireless International Service. In all such cases, the Office of Posts and Telegraphs shall communicate with the foreign administrations and authorities concerned.

ART. 3.—The Director of Posts and Telegraphs shall deal directly with the Secretary-General of the Ministry of Marine in all cases relating to the Maritime Radiotelegraphic Service.

ART. 4.—The necessary instructions to give effect to the provisions of Art. 1, paragraph (c), and all other regulations concerning the internal management of the radiotelegraphic stations in this jurisdiction, will be issued through the Department of Radiotelegraphic Service. These instructions shall be communicated to the stations by means of private circulars.

SUB-SECTION 5.

THE GENERAL OFFICE OF THE PREFECT-GENERAL OF PORTS.

ART. 1.—The duties of the Prefect-General of Ports will be as follows:—

(a) He shall give effect to the provisions made in Articles 4, 5 and 6 of Law 9127 and shall direct the deposit at the Bank of the "Nación Argentina" of the fines imposed for the non-fulfilment of said provisions. The money so deposited must be placed to the order of the Director of Posts and Telegraphs.

(b) He shall receive from shipping companies, captains or passengers all complaints regarding unsatisfactory service in the coast and ship stations, and shall forward them to the head of the Maritime Radiotelegraphic Service.

(c) Should any complaints be made upon the arrival in port of any vessel, the Prefect shall collate the evidence and forward it to the head of the Naval Radiotelegraphic Service, and he shall act in the same manner should the complaints be made in writing.

(d) He shall prevent the departure of any ship which may have failed to make the necessary deposit at the National Bank (to the order of the Director of Posts and Telegraphs) of the fines imposed in accordance with article 6 of Law 9127.

(e) Both upon the arrival and departure of merchant ships the prefect shall have the wireless installations inspected in order to ascertain whether they are in perfect working order and whether the power of the apparatus is that fixed by Law 9127.

ART. 2.—The General Office of the Prefect-General of Ports will refer all matters concerning ship stations to the Director of the Public Maritime Radiotelegraphic Service.

ART. 3.—Besides the inspection and control of ship stations in territorial waters and on craft of all register the general office of the Prefect-General of Ports must attend to the following:—

(1) The dismantling of the transmitting apparatus of the wireless installation as soon as the ship has moored or anchored.

This precaution could be dispensed with, with the consent of the Maritime authority, in the ports of the Southern Coast and in river ports, where no radiotelegraphic land stations are in existence.

(2) He shall ascertain whether the wireless operator or operators have licences corresponding to the installation they are working, in conformity with Article X of the Service Regulations annexed to the London Convention.

(3) In such cases as those covered by Article XII of the Service Regulations above mentioned, the Prefect-General of Ports shall act jointly with the Director-General of Supplies of the Ministry of Marine in order to give effect to the provisions of the said Article.

ART. 4.—First contraventions of the provisions of Art. 5, paragraph 1, will be recorded by the General Office of the Prefect-General of Ports, and each of those following the first will cause a fine of one hundred pesos, national currency.

SUB-SECTION 6.

COAST STATIONS.

Under the Control of the Head of the Public Maritime Radiotelegraph Service and Open to Public Service

ART. 1.—The internal service of these stations will be subject to the provisions of these Regulations and those that may be brought into force subsequently.

ART. 2.—Coast Stations not open to public service may or may not be shown in the Official Nomenclature as deemed expedient by the Ministry of Marine.

ART. 3.—Radiotelegrams must be deposited by the public at telegraph offices, but radiotelegraphic coast stations subject to the Ministry of Marine will receive direct, and within the regulation hours telegrams presented by the public at such stations when there does not exist a telegraph office in the locality or in the event of such telegraph office being without communication with the remainder of the system.

Exception from this provision is made for private radiotelegrams from the personnel of the Navy and addressed to stations of the Ministry of Marine, and such radiotelegrams, whether or not there is a telegraph office at the

place of origin, may be despatched on prepayment of the relative tariff from any radiotelegraph coast station under the control of the said Ministry.

The radiotelegrams referred to in the first paragraph shall follow this route, namely:—

(a) Messages originating from a telegraph office shall continue transmission by the telegraph route as far as the place where is situated the radiotelegraph coast station that is to transmit them to a ship or to the coast station which is nearest that of destination.

(b) Messages handed in by the public at coast stations shall be transmitted by wireless route to the nearest telegraph office having expeditious communication, and thence by the telegraph system to the point of destination or to the other coast station that is to transmit them to the ship station.

(c) Radiotelegrams to ship stations that are within the range of the coast stations from which they originate will be interchanged direct.

With regard to radiotelegrams deposited by the public at coast stations, and destined for a place in the interior of the country or abroad, and those messages which, owing to interruption of the telegraph line with the point of destination, are handed in at a telegraph office for transmission by wireless route, will be accepted only conditionally.

ART. 4.—Coast stations will accept and retransmit traffic handed over to them by the National Telegraphs, when such traffic cannot reach its destination in due course, by reason of interruption or congestion of its lines. Either of these two circumstances will be communicated directly by the chiefs of the District to the Officers in Charge of the stations, who will also be advised of the extent of the interrupted sector, or in case of congestion, the number of messages to be retransmitted by the wireless route in order to normalise the traffic. In case of lack of communication between the telegraph office and its head office, the Chief of the former will directly request the co-operation of the interchange radiotelegraph station, making known this circumstance.

In case of interruption or congestion of the lines south of Bahia Blanca, messages from and for Punta Arenas will be retransmitted by stations of the radiotelegraph system only in the event of their destination or origin being any of the offices comprised between Bahia Blanca and Ushuaia.

ART. 5.—If, although there exists at the place where the message is handed in a National Telegraph Office, having efficient communication, or when the message could be retransmitted to destination by the telegraph lines, the sender should, nevertheless, prefer the radiotelegraph route, over the greater part of its transmission, the message will be charged double the ordinary tariff collected by the National Telegraphs in respect of inland telegrams, without prejudice to other taxes that may be applied, calculated according to general rules.

ART. 6.—The men of the Navy shall be able to make use of the wireless system over the greater part of the route from any radiotelegraph station under the control of the Minister of Marine on payment of double the ordinary tariff as mentioned in the previous Article.

Crews and passengers of mercantile vessels of Argentine registry will enjoy the same privilege on payment of the double coast tax.

ART. 7.—Coast stations will not accept from the public messages in secret languages unless they have been previously visé by the Chief of the Telegraph Office of the place.

ART. 8.—Messages for the "Press, Stock Exchange and Commercial Centres," will not enjoy the half-rate concession that applies to transmission over the National telegraph lines, if the sender should prefer the radiotelegraph route.

ART. 9.—Public messages received by radiotelegraph stations will be delivered, without exception, to the nearest Post Office for distribution.

ART. 10.—The prefix "DPX" will be employed for those public messages whose senders have paid the double tariff or coast charges indicated in Articles 5 and 6. Such messages will have priority of transmission by the wireless route over other public messages.

ART. 11.—The hours which will be in force at coast stations, as regards attention to the public, will be from 8 a.m. to 8 p.m., both in winter and summer.

ART. 12.—For the supervision of the radiotelegraph service and control of the fulfilment of everything specified in the International Radiotelegraph Convention of London, and of the present regulations, on the part of all radiotelegraph stations, whether ship stations or coast stations in the maritime zone, the under-mentioned are designated as stations of control:

Dársena Norte will control the port of Buenos Aires and the vicinity.

La Paz will control the port of Rosario and the vicinity.

Rio Santiago will control the port of La Plata and the vicinity.

Puerto Militar will control its own port and Bahía Blanca and the vicinity.

Cabo Virgenes will control the south coast.

ART. 13.—In the territories of Santa Cruz and Tierra del Fuego the control over the radiotelegraphic service will be exercised by an inspector appointed by the Ministry of Marine.

ART. 14.—For the purpose of accounts, the coast station will be considered as the terminal station in respect of radiotelegrams emanating from the national radiotelegraph service for ship stations, and shall be considered as stations of origin for those messages emanating from ships.

ART. 15.—Coast stations shall accept with absolute priority distress messages made by ships and shall transmit them as "Urgent" messages over the land system.

ART. 16.—Coast stations shall not despatch any official radiotelegram by the lines of the National Telegraphs emanating from vessels or departments of the Ministry of Marine which can reach its destination without such requisite.

Exception is made as regards official urgent radios which may be delayed by interruptions in the radiotelegraph transmission due to atmospheric perturbations or other causes. Nevertheless, according as services may allow, they will be transmitted by the wireless route.

ART. 17.—When a vessel of the National Navy shall transmit the "Interruption" signal — • • • — repeated several times and followed by her call signal, national merchant vessels and coast stations shall suspend all communication immediately, excepting in cases of shipwreck.

This signal of interruption which is designated as "Naval Service," shall only be used on the order of the commander of the vessel and shall be employed only in urgent cases that do not permit the normal service wait.

ART. 18.—Apart from cases of shipwreck, the station of Dársena Norte has precedence over the others. When that station transmits the interruption signal, all land stations and ships

shall suspend their communications to enable the Station of Dársena Norte to work without interruption.

ART. 19.—The radiotelegraphic coast stations of the State performing the service of the National Telegraphs shall also observe an internal time table between themselves for the interchange of radios of the public service.

ART. 20.—All national ship and land stations shall suspend their communications during the time that the stations designated for the purpose are transmitting the "Top Radiotelegrafico."

ART. 21.—This decree to be communicated, published, etc., etc.

SUB-SECTION 7.

NATIONAL WARSHIP STATIONS.

ART. 1.—Warship and coast stations shall use for official messages the maximum wavelength possible for their aerials, and should they have to transmit messages to Argentine merchantmen or to foreign merchant steamers they must use the wavelengths specified by the London Convention and by these Regulations.

ART. 2.—In order to avoid difficulties in the general radiotelegraphic service arising from the use by and between Navy units employing Wireless, and which work with the normal wavelength (600 metres) — thus producing interruptions that prevent the reception of other radiograms—this method will be followed, namely:—

For Wireless communications in general, between Navy units, their station shall employ the following wavelengths:—

1,000 METRES: Ships *Moreno, Rivadavia, General San Martín, General Belgrano, Pueyrredon, Garibaldi, Buenos Aires, 9 de Julio, Presidente Sarmiento, Pampa, Chaco.*

450 METRES: Ships *Almirante Brown, Libertad, Independencia, Paraná, Rosario, Patria, Córdoba, La Plata, Catamarca, Jujuy, Entre Ríos, Misiones, Corrientes, Guardia Nacional, 1° de Mayo, Ministro Ezcurra, Alférez Mackinlay, Ona, Querandí, Azopardo, Piedra Buena, Vicente Fidel López, Uruguay, and Gaviota.*

2. When the distance between ships does not allow of the establishment of wireless communication with the wavelength mentioned above (No. 1) the operator shall use the efficient wavelength that his apparatus may permit.

3. The normal 600 metres wavelength shall be used exclusively for general service between ships and land stations, national or foreign.

4. After the radiotelegraphic communication is established by any means as mentioned above (Nos. 1 and 2), the operator shall with the minimum power required for obtaining effective communication in accordance with the provisions of the London Radiotelegraphic Convention.

5. The syntonisation of the radiotelegraphic stations on board ships of the Navy, shall be controlled and regulated by the Radiotelegraphic Service Department, in accordance with the wavelengths established by Art. 1, and taking into consideration the normal wave of 600 metres.

SUB-SECTION 8.

WIRELESS ON MERCHANTMEN.

ART. 1.—All merchant vessels, whether mechanically propelled or otherwise, carrying fifty or more persons (passengers and crew) must be fitted with a wireless installation in perfect working order, except in the cases referred to in Articles 4, 5 and 6 below,

The above applies to all craft in similar conditions entering or leaving Argentine ports.

ART. 2.—Wireless apparatus in charge of an efficient operator must have at all times a transmitting power of no less than 200 kilometres for river craft and of no less than 500 for sea craft.

ART. 3.—No ships will be allowed to clear when the above provisions have not been duly complied with, and should captains or ship masters endeavour to avoid or contravene this rule the Superior Port Authority can impose a fine of not less than 1,000 pesos and not exceeding 5,000. Those penalised in that way can appeal to the Federal Court having jurisdiction on the locality where the fault has been committed. The fine will be doubled in cases of repetition of the offence.

ART. 4.—Ships exclusively navigating the rivers of the Republic are exempted from the obligation of carrying wireless on board, but those plying between Argentine and Uruguayan ports on the River Plate and those employed in the coasting trade must carry radiotelegraphic installations.

ART. 5.—The following are the exceptions to the rule established by Article 1:—

(1) Those ships which only by accident or under exceptional circumstances carry fifty or more passengers either because the captain has been obliged to get extra help in order to replace the sick members of the crew, or because he has taken aboard the passengers and crew of some vessel in distress.

(2) Those ships on which, by reason of the route they follow or because of the conditions on which they set out to sea, it may be considered that the carrying of a wireless installation would be useless and superfluous.

(3) Those ships where the number of passengers may be raised by exceptional or accidental circumstances to 50 or more, owing to their having received on board these additional passengers in the course of the voyage for the purpose of transshipment, with the additional proviso that such vessels do not go farther than 150 miles from the nearest coast.

(4) Sailing ships of primitive construction, such as pontoons and lighters, when it is impossible to fit them with wireless.

ART. 6.—Vessels which have started their voyage without meeting the requirements of these regulations cannot be observed or attended to if, by reason of bad weather or through force majeure, they are compelled to seek refuge in Argentine ports.

ART. 7.—All foreign ships carrying wireless installations are divided into three classes according to the classification made regarding ship stations in Article XII of the Regulations annexed to the Radiotelegraphic Convention signed in London on July 5th, 1912. These classes are:—

FIRST CLASS.—Vessels carrying a permanent wireless service.

All vessels fitted to carry 25 or more passengers are included in the *First Class*.

(1) If their average speed be of 15 knots or more.

(2) If they have an average speed of over 13 knots; but only provided they carry 200 or more persons (passengers and crew) and provided also that they traverse a distance of more than 500 nautical miles between two ports of call. These ships, however, may be classified under the second class provided that they maintain a continuous watch.

SECOND CLASS.—Vessels having a limited wireless service.

Those ships fitted to carry 25 or more passengers which for some other reasons may not have been included in the first class are included in this second class.

All ships of the second class must, whilst at sea, keep continuous watch during seven hours every day, and watch also for ten minutes at the beginning of each of the remaining seventeen hours.

THIRD CLASS.—To this class belong those ships, national or foreign, carrying a wireless installation without any fixed working hours or not included in the first and second classes.

The owner or builder of a ship included in the second or third class has the right to demand that in the certificate of safety issued to him mention be made of the fact that the ship belongs to a higher class, provided the vessel fulfils the requirements laid down for the higher class.

ART. 8.—National and foreign ships carrying wireless must keep a constant watch in the following cases:—

(1) Passenger ships running to Montevideo.

(2) All ships belonging to the first class.

(3) Ships belonging to the second class, whenever they are at a distance of over 500 miles from the nearest coast.

(4) (a) Ships carrying more than 50 persons and which, by reason of their movements, are obliged to navigate at a distance of over 1,000 miles from the nearest coast.

(b) Fishing craft, including whalers, on board of which wireless telegraphy must be carried, are not obliged to keep a continuous watch.

(c) The continuous watch above referred to must be carried out by two or more first-class qualified telegraphists, as provided for in Article X of the Regulations annexed to the Convention.

ART. 9.—Any ship which must carry wireless and which is classified in the first or second class must have an emergency installation in accordance with Article XI of the Regulations annexed to the Radiotelegraphic Convention.

In every case, the emergency installation shall be placed in its entirety on the upper deck of the ship and should be located as high up as possible.

The emergency installation must have a source of energy of its own, must be of such a nature that it can be set in motion very rapidly, and must be capable to work for a minimum of six continuous hours and possess a range of 150 kilometres.

This emergency installation is not required in the case of those ships whose *normal* installations fulfil all the requirements demanded by this Article (as enumerated in the preceding clause).

The licence referred to in Article IX of the Regulations annexed to the International Radiotelegraphic Convention cannot be granted if the installation fails to comply with the requirements demanded by the said Convention and by the present regulations.

ART. 10.—All points raised in the Radiotelegraphic International Convention and its Regulations which affect ship stations, the transmission of messages, and the issue of certificates to wireless operators, are governed by the following:—

(1) The Rules laid down in the above-mentioned Convention and its Regulations, as well as all the amending Regulations which may from time to time be substituted for them.

(2) The present Regulations whenever their provisions can be considered as additions to the above.

SUB-SECTION 9.

RULES FOR WIRELESS INSTALLATIONS ON NATIONAL MERCHANTMEN.

ART. 1.—All Shipping Companies whose vessels are included in the Regulations laid down in Wireless Law No. 9127 must obtain a permit from the Ministry of Marine and through the Prefect-General of Ports for the installation of wireless stations on their ships.

ART. 2.—Wireless stations on national ships devoted to the conveyance of passengers will be classified as belonging to the first class, and wireless stations on cargo boats will be included in the second class (Article XIII of the Service Regulations annexed to the Wireless Convention).

When Shipping Companies apply for permission to instal wireless in their vessels they must indicate the class occupied by such vessels, and this classification must be verified by the Office of the Prefect-General of Ports before forwarding the application to the Secretary-General of the Ministry of Marine.

ART. 3.—As soon as the permit has been granted, and immediately after the stations have been erected on the ship, the company must notify the Prefect-General of Ports, so that the latter may—after previous inspection by the wireless inspector—issue the corresponding licence through the Chief of the Maritime Wireless Service. This licence will be handed over as soon as the charge of 5 pesos (national currency) for the defrayment of expenses has been paid.

ART. 4.—The Ministry of Marine will grant the licence:—

(a) If the wireless installation fulfils all the requirements of the law in the matter of range and also if the installation belongs to a system permitting of its being tuned to the wavelengths specified in the London Wireless Convention, within an approximation of 5 per cent.

(b) If a deposit to the order of the Director General of Posts and Telegraphs has been made in the "Banco de la Nación Argentina" of the amount previously fixed by this office as a guarantee for the exchange of radiograms. This deposit must amount at least to one hundred pesos, national currency.

(c) The depositors shall not dispose of the deposit (as provided in (b)) unless they previously notify the administration that their vessels are going to discontinue their registered service, and that sufficient time has elapsed to effect the final liquidation of accounts for radiograms exchanged.

(d) Stations on board ships from a country with which no agreements have been entered into for the exchange of radiograms (between our stations and its ships), will be subject to the conditions (a) and (c). In this case the deposit must be made, before any service is rendered, by the agents of the shipping company owning the vessel.

ART. 5.—Wireless installations on ships belonging to the national merchant service must be furnished with the following papers:—

(1) The licence authorising the installation.

(2) One copy of the London Wireless Convention.

(3) One copy of the Wireless Law.

(4) One copy of the Wireless Regulations.

(5) The Official List of Wireless Stations and alphabetical list of call letters.

(6) Radiogram forms.

(7) One copy of the standing wireless rates, which must be kept where it can be plainly seen.

(8) One slate, placed outside the wireless cabin, so that the names of those stations within range may be noted thereon for the information of the public.

ART. 6.—The stations on board national merchantmen must be disposed in such a way that the State's stations may receive the waves emitted by the former.

ART. 7.—Radiotelegraphists are forbidden to operate in unlicensed stations.

It is their duty to report to the Prefect-General of Ports any attempt to induce them to disregard this prohibition.

ART. 8.—(a) When a "licence" is issued the station receives its call letters, which will be published in the Official List of Radiotelegraphic Stations issued by the Berne International Telegraphic Bureau.

Stations licensed for public service "must not use," not even for private purposes, other call letters than those assigned them by the Director of the Maritime Public Radiotelegraphic Service.

(b) The operators in charge of the stations will be responsible for any infringement of the above provision.

Arts. 9 and 10 contain instructions to operators concerning their responsibilities, keeping of records, testing emergency set, etc.

ART. 11.—When a national merchant ship happens to enter a zone where naval manoeuvres are being performed by men-of-war using their wireless, the merchant ship must ask for a licence from the chief of operations to send her messages to the land stations, and in so doing she must state the approximate time that will be required to transmit the traffic in hand.

In these communications both the man-of-war and the merchant ship will use the prefix "T.R."

ART. 12.—Whenever these Regulations are infringed, information about the facts will be gathered, and in view of the evidence fines will be imposed, according to the national and international laws and regulations governing the telegraphic and radiotelegraphic services. The payment of the fines will not prevent further legal action, as may be required by the nature of the fault.

A "licence" may be cancelled if the findings in the summary show the convenience of so doing.

SUB-SECTION 10.

OFFICIAL CLASSIFICATION, RATES, COLLECTIONS, AND ACCOUNTS IN ALL KINDS OF RADIOTELEGRAPHIC STATIONS.

(SUMMARY.—The full text was published in the Year Book, 1924.)

ART. 1.—Details the offices dealing with the accounts relating to radiograms. ARTS. 2 to 4—Deal with special privileges and rates for naval radiograms. ARTS. 5 to 7—Deal with the settlement of accounts. ART. 8—Publications giving the rates in force. ARTS. 9 to 14—Procedure for collection and settlement of accounts. ART. 15—Publication of particulars of land and ship stations. ART. 16—Method of counting the words. ART. 17—Originals of radiograms and documents preserved by Posts and Telegraphs Department for fifteen months. ART. 18—

Settlement of reimbursements in accordance with provisions of the International Convention.
ART. 19.—Radiotelegraphic stations in places where no telegraphic office exists will be considered as national telegraph offices, and the radiotelegraphic rates will be applied only to messages exchanged with ship stations.

CHAPTER III.

NAVY RADIOTELEGRAPHIC STATIONS SERVICE (the full text was published in the Year Book, 1924). Sub-section 1 defines the duties of the staff, the keeping of records, calling up coast stations, etc. Sub-section 2, general rules to be observed by naval operators. Sub-section 3, special book-keeping of naval stations.

DECREE NO. 1, OF OCTOBER 13, 1919.

Buenos Aires, October 13th, 1919.

The Executive Power of the Nation decrees

ART. 1.—All restrictions imposed having reference to the use of radio-telegraph installations on merchant vessels are removed.

ART. 2.—Merchant vessels shall not make use of their transmitting apparatus on entering the zone comprised within a radius of five nautical miles of the radiotelegraph stations open to public service, and during such period as they remain in that zone. Nevertheless they shall be able to use their transmitters in case of urgent necessity to make calls for assistance.

ART. 3.—A final period of six months is granted for Argentine merchant vessels to comply with the conditions stipulated by the General Regulations of the Radiotelegraph Service.

ART. 4.—At the General Prefecture of Ports an Office of Radiotelegraph Inspection shall be brought into operation which will see that merchant vessels comply with the stipulations of the International Radiotelegraph Convention of London and the General Regulations as regards the Radiotelegraph Service.

ART. 5.—This decree to be communicated, published, etc., etc.

(Sd.) IRIGOYEN, JULIO MORENO.

DECREE NO. 2 OF OCTOBER 13, 1919.

Buenos Aires, October 13th, 1919.

The Executive Power of the Nation decrees:

ART. 1.—Authorises the "Division Servicio Radiotelegrafico" to arrange for the Radiotelegraph Works of the Navy to carry out, on board merchant vessels entering the ports, all work that may be required by the radiotelegraph stations of those vessels.

ART. 2.—On the termination of the work the amount incurred as regards wages and materials with an additional charge of 10 per cent. as compensation for the use of machinery and costs of administration shall be liquidated the amount in question to be paid by the captain or shipowner before the vessel leaves the port.

ART. 3.—The sums collected in this manner shall be paid over by the "Division Servicio Radiotelegrafico" to the Treasury of the General Administrative Authorities, so that in due course they may be paid to the General Treasury of the Nation and credit granted for the items destined for the radiotelegraph stations of the Navy.

ART. 4.—The Radiotelegraph Inspectorate of the General Prefecture of Ports shall make this Decree known to captains and shipowners.

ART. 5.—This decree to be communicated, published, etc., etc.

(Sd.) IRIGOYEN, JULIO MORENO.

DECREE OF THE EXECUTIVE POWER, DATED MAY 27TH, 1924, REGULATING BROADCASTING, EXPERIMENTAL AND AMATEUR STATIONS.

ART. 1.—In order to instal a broadcasting, experimental or amateur radio-electric transmitting station, the party concerned must make an application to the Ministry of Marine or of the Interior, as the case may be, who will grant a licence when the applicant has satisfied the requirements which are specified hereunder.

Persons who have installed or may instal receiving apparatus must, for statistical purposes, inform the Ministry concerned.

ART. 2.—Radio-electric broadcasting stations shall not perform services which are not authorised by the Law of National Telegraphs. Neither shall they make tests or experiments from 10 a.m. to 12 midnight, and their working shall be suspended while the radio-electric stations of the State transmit time or meteorological signals if they impede the reception of the same.

Broadcasting stations shall be divided into two classes:—

Class A.—Stations of a power of less than 5,000 watts in the aerial, working on waves with frequencies between 1,090 and 1,200 kilocycles (275 and 250 metres respectively). They shall be worked by operators holding at least an amateur's licence, and a time-table shall be drawn up for their working if the number of stations of this class in the same locality shall render it necessary.

Class B.—Stations of a power of 500 or more watts in the aerial, transmitting on waves with frequencies between 705 and 920 kilocycles (425 and 325 metres respectively). They shall be worked by operators holding at least a second class certificate, and a time-table shall be drawn up for their working if the number of stations of this class in the same locality renders it necessary.

Whatever be the class and location of the broadcasting stations, their maximum power in the aerial shall be limited according to the interference which they may cause to any wireless station operated by the State or authorised by the same to maintain a fixed service.

ART. 3.—Radio-electric transmitting stations, to be used solely for tests which have for their object the technical or scientific progress of radio-communication, must be worked by persons holding at least an operator's second class certificate. In each licence there must be stated the period of its validity, the frequencies of waves to be employed, and the power which may be used.

In order that these stations may not cause interference with public and official services, each test shall be carried out in accordance with a programme drawn up in advance, and every precaution taken to ensure non-interference.

Applicants for licences for these experimental stations shall present personal data which attest their technical knowledge and the general lines on which they propose to carry out their investigations. The corresponding authority shall determine in each case whether, in view of the nature of the experiments contemplated, the granting of this class of licence is indispensable or not.

ART. 4.—Radio-electric amateur transmitting stations, installed for purposes of study shall work on waves of a frequency greater than 1,200 kilocycles (250 metres), and may only

use transmitters giving out pure continuous waves, interrupted continuous waves, continuous waves modulated for speech or musical sounds, and damped waves. This last type of transmitter shall not be installed within 10 kilometres from a state station or from one authorised by the State to carry on a fixed service. Within this radius the power of any amateur station shall not exceed 200 watts, and outside it 500 watts, measured on the basis of the primary energy of the transformer, or the number of watts in the plate circuit if valves are used.

These stations shall be worked by persons holding an amateur's licence or operator's certificate.

ART. 5.—Waves transmitted by radio-electric stations shall be as little damped as possible. For spark stations the logarithmic decrement of a complete oscillation shall not be greater than two-tenths, and in the case of continuous wave stations and wireless telephonic stations, the equivalent decrement shall not exceed that specified in the licence.

ART. 6.—The radio-electric stations to which this decree relates shall only be able to use the official call signal which is entered in the licence.

ART. 7.—Licences shall be personal and at whatever time they may be granted they shall expire on the 31st December of each year, and must be renewed sufficiently in advance for the station to be able to continue working.

ART. 8.—As far as possible, transmitting stations shall be inspected before their working is authorised.

ART. 9.—Any radio-electric installation is subject to inspection at any time by the persons appointed by the competent authority, and they must be supplied with the information they ask for.

ART. 10.—The amateur's licence shall be issued to any person who, in accordance with the official programme drawn up in advance, shall pass a satisfactory examination and show that he has sufficient knowledge of the adjustment, working and management of the apparatus which it is proposed to operate as well as of the provisions contained in the Regulations annexed to the London Wireless Telegraphic Convention and those of the present decree.

It is left to the judgment of the competent authorities to conduct the examination orally or in writing, as circumstances permit.

ART. 11.—Wireless electric transmitting stations to which this decree refers may be closed at any moment deemed fitting by the Ministry exercising jurisdiction in the zone within which they are installed.

ART. 12.—Persons infringing the provisions of the present decree shall be liable to the general provisions and penalties set out in the National Telegraph Law of 1875, without prejudice to the immediate withdrawal of the licence.

ART. 13.—All radio-electric transmitting stations included under the present decree, must comply with the conditions therein as from the 1st July, 1924.

ART. 14.—Let it be communicated, etc.
(Sd.) ALVEAR, M. DOMECQ GARCIA.
VICENTE C. GALLO.

AUSTRALIAN COMMONWEALTH

(See Maps 54 and 56.)

Including : New South Wales, Victoria, Queensland, South Australia, Western Australia, Tasmania, the Northern Territory of Australia.

CONTROL AND ORGANISATION.

ORIGINALLY radiotelegraphy was organised in Australia under the supervision of the Postmaster-General, the Naval Department exercising jurisdiction independently over their own radiotelegraph stations.

By an Order of the Governor-General in Council of June 1st, 1922, the control of wireless services of the Commonwealth was transferred to the Prime Minister's Department with such existing staff as the Prime Minister may require for the economic and efficient working of the service.

The great distances and sparsely-peopled spaces of Australia make the subject of broadcasting one of the greatest importance to isolated settlers. In the early part of 1923 the Postmaster-General invited a Conference of those interested including manufacturers, broadcasting companies, dealers and experimenters whose recommendations were accepted as a basis in the Commonwealth Broadcasting Regulations which came into operation on August 1st, 1923, the most important features being:—

- (1) Broadcasting stations licensed to transmit on one wavelength and to collect subscriptions from all licensed receivers using that wavelength within their range.
- (2) Broadcasting stations must submit a guarantee that satisfactory service will be provided for a period of at least five years.
- (3) A limited number of broadcasting transmitters are to be allowed to operate in any given area. Wavelength and power restrictions being enforced to prevent interference.

- (4) Broadcasting receivers are to be designed only for the reception of one or more given services, the users being required to pay a small annual fee to the Company responsible for the service or services which the instrument is designed to receive.
- (5) The receivers to be of a non-oscillating type and must be sealed so that their wavelength cannot be altered without notification.

There will be no monopoly of any one broadcasting company in any given area, and, where more than one service is available, the purchaser of any instrument can specify which service or services it is desired to receive.

The system of sealed sets, however, proved so unsatisfactory that a further conference was held, and, in July, 1924, the Prime Minister announced that the Ministry had decided to adopt a new basis. Existing licences would be continued, but the sealed set had been done away with, and anybody would be able to receive the programmes broadcast, provided that they had a receiving set and paid the licence fee for the programme they received. The principal provisions of the new proposed regulations are printed below (under R p. 69).

ADMINISTRATION.

The Act to Regulate Radiotelegraphy in Australasia was passed in 1905. A number of additions and modifications were introduced by Wireless Telegraphy Acts No. 33 of 1915 and No. 4 of 1919, and this amended text will be found below, it being the extant Governing Decree under which wireless is at present administered.

In 1912 the Commonwealth Parliament passed the Navigation Act wherein is contained a clause which makes it compulsory for ships trading in Australian waters to be fitted with radiotelegraphic apparatus.

The regulations issued under this Act have been consolidated under the Navigation (Wireless Telegraphy) Regulations, 1924, printed (under Q) below.

Since March 1st, 1923, the Administration of the Wireless Act has rested with the Postmaster-General's Department.

We append the text of current radiotelegraphic legislation in accordance with the following list :—

- A**—Wireless Telegraph Act, 1905, (No. 8), as amended by Act No. 33 of 1915 and Act No. 4 of 1919.
- B**—Wireless Telegraph Regulations Statutory Rules 1923, No. 97.
- C**—Form of Licence for Coast Station.
- D**—Form of Licence for Ship Station.
- E**—Form of Licence for Land Station.
- F**—Form of Licence for Broadcasting Station.
- G**—Form of Licence for Broadcast Receiving Station.
- H**—Form of Licence for Dealing in Wireless Apparatus.
- I**—Experimental Licence for Transmitting and Receiving.
- J**—Experimental Licence, Receiving only.
- K**—Form of Licence for Portable Station.
- L**—Form of Licence for Aircraft Station.
- M**—Certificate of Proficiency, First Class.
- N**—Certificate of Proficiency of Watcher.
- O**—Statutory Declaration regarding Secrecy of Wireless Communications.
- P**—Extract from Navigation Act, 1912.
- Q**—Regulations under the Navigation Act, Statutory Rules 1924, No. 72.
- R**—Summary of Projected New Regulations for Broadcasting.

ACT NO. 8 OF 1905.

As amended by the Wireless Telegraphy Acts,
No. 33 of 1915 and No. 4 of 1919.)

A 1 *Short Title*.—This Act may be cited as the Wireless Telegraphy Act, 1905

2 *Interpretation*.—In this Act—

“Australia” includes the territorial waters of the Commonwealth and any territory of the Commonwealth;

“Wireless Telegraphy” includes all systems of transmitting and receiving telegraphic or telephonic messages by means of electricity without a continuous metallic connection between the transmitter and the receiver.

3 *Exemption of ships of War*.—This Act shall not apply to ships belonging to the King's Navy.

4. *Exclusive Privileges*.—The Minister for the time being administering the Act shall have the exclusive privilege of establishing, erecting, maintaining and using stations and appliances for the purpose of—

(a) transmitting messages by wireless telegraphy within Australia, and receiving messages so transmitted, and

(b) transmitting messages by wireless telegraphy from Australia to any place or ship outside Australia, and

(c) receiving in Australia messages transmitted by wireless telegraphy from any place or ship outside Australia.

5. *Licences*.—Licences to establish, erect, maintain, or use stations and appliances for the purpose of transmitting or receiving messages by means of wireless telegraphy may be granted by the Minister for the time being, administering the Act for such terms and on such conditions and on payment of such fees as are prescribed.

6. *Penalty for Breach of Act*.—(1) Except as authorised by or under this Act, no person shall—

(a) establish, erect, maintain, or use any station or appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy; or

(b) transmit or receive messages by wireless telegraphy.

Penalty: Five hundred pounds, or imprisonment with or without hard labour for a term not exceeding Five years.

Ships fitted with Apparatus for Wireless Telegraphy.—(2) Sub-section (1) of this section shall not, except as prescribed, extend to appliances maintained on any ship, arriving from any place beyond Australia, for the purpose of enabling messages to be transmitted from or received on that ship by means of wireless telegraphy, but all such appliances shall, while the ship is within Australia—

(a) Be subject to the control of the Minister for the time being administering the Act; and

(b) Only be used by his authority or as authorised by the regulations.

Penalty: Five hundred pounds.

7. *Forfeiture of Appliances Unlawfully Erected*.—All appliances erected, maintained, or used in contravention of this Act or the regulations, for the purpose of transmitting or receiving messages by means of wireless telegraphy, shall be forfeited to the King for the use of the Commonwealth.

8. *Search Warrants for Appliances Unlawfully Erected*.—(1) If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that any appliance is established, erected, maintained, or used in contravention of this Act or the

regulations, for the purpose of transmitting or receiving messages by means of wireless telegraphy, he may grant a search warrant to any person.

(2) A search warrant under this section shall authorise the person to whom it is addressed to break and enter any place or ship, where the appliance is, or is supposed to be, either by day or by night, and to seize all appliances which appear to him to be used or intended to be used for transmitting or receiving messages by means of wireless telegraphy.

9. *Proceedings in Respect of Offences*.—(1) Proceedings for any offence against this Act may be instituted in any Court of Summary Jurisdiction, and any person proceeded against under this section may be dealt with summarily or may be committed for trial.

(2) The Court in dealing summarily with any accused person under this section may, if he is found guilty of any offence against this Act, punish him by imprisonment with or without hard labour for any period not exceeding six months, or by a penalty not exceeding Fifty pounds.

10. *Regulations*.—The Governor-General may make regulations, not inconsistent with this Act, prescribing all matters which by this Act are required or permitted to be prescribed or which are necessary or convenient to be prescribed for carrying out or giving effect to this Act.

STATUTORY RULES.

1923. No. 97.

REGULATIONS UNDER THE “WIRELESS TELEGRAPHY ACT 1905-1919.”

B I, the Governor-General in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Wireless Telegraphy Act 1905-1919, to come into operation on the first day of August, 1923.

Dated this 25th day of July, 1923.

FORSTER,
Governor-General.

By His Excellency's Command,
W G GIBSON,
Postmaster-General

WIRELESS TELEGRAPHY REGULATIONS

PART I.—PRELIMINARY.

1. These Regulations may be cited as the “Wireless Telegraphy Regulations.”

2. These Regulations are divided into Parts, as follows:—

Part I.—Preliminary.

Part II.—Licences: Classes and Conditions.

Part III.—Applications for Licences.

Part IV.—Broadcasting.

Division 1.—Broadcasting Stations.

Division 2.—Broadcasting (Receiving) Stations.

Division 3.—Sale of Broadcasting (Receiving) Apparatus.

Part V.—Working of Stations.

Part VI.—Control of communications and Appliances in Emergencies.

Part VII.—Proficiency Certificates for Operators and Watchers.

Part VIII.—Miscellaneous.

3. In these Regulations, unless the contrary intention appears—

“Accredited agent” means an accredited sales agent or an accredited representative of a manufacturer;

“Act” means the Wireless Telegraphy Act 1905-1919;

"Aircraft station" means a station on aircraft operated for the purpose of communicating with other authorised stations;

"Australia" includes the territorial waters of the Commonwealth and of any territory of the Commonwealth;

"Australian ship" means a ship registered in Australia;

"Authorised officer" means any officer thereto authorised in writing by the Minister and includes the Chief Manager;

"Authorised station" means a station in respect of which a licence is issued;

"British ship" means a British ship other than an Australian ship;

"Broadcasting station" means a station on land for the purpose of broadcasting to licensed broadcasting (receiving) stations;

"Coast station" means a station which is established on land or on board a ship permanently moored, and which is open for the transmission and receipt of messages by means of wireless telegraphy between land and ship stations or other coast stations;

"Department" means the Postmaster-General's Department;

"Experimental station" means a station used solely for the purpose of instruction or demonstration in, or investigation into, wireless telegraphy;

"Foreign ship" means a ship other than an Australian ship or a British ship;

"Government message" means a message transmitted on behalf of the Government of the United Kingdom or the Government of the Commonwealth;

"Harbour" includes any harbour properly so-called, whether natural or artificial, or any estuary, navigable river, pier, jetty, or other work in or at which a ship can obtain shelter, or ship or unship goods or passengers;

"International Telegraph Convention" means the International Convention of St. Petersburg, dated the 10th-22nd July, 1875, and includes any modifications of the Convention made from time to time;

"International Telegraph Regulations" means the service regulations made under the International Telegraph Convention, and includes any modifications of those Regulations made from time to time;

"Land station" means a station, not being a coast station, established on land for the purpose of communicating by means of wireless telegraphy with other stations;

"Licensed installation" means an installation at a station in respect of which a licence is issued;

"Licensee" means any person to whom a licence has been granted under these Regulations;

"Military signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more sets of appliances for wireless telegraphy or telephony operated by or on behalf of the Military Forces of the Commonwealth of Australia, or between one such set of appliances and any other wireless telegraphy or telephone station;

"Minister" means the Minister for the time being administering the Act, and includes the Minister or member of the Executive Council for the time being acting for or on behalf of the Minister;

"Naval signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph or telephone station, whether on shore or on any ship;

"Portable station" means a station in no fixed location capable of being removed from place to place and being operated in transit for the purpose of communication by wireless telegraphy with other authorised stations;

"Ship station" means a ship (not permanently moored) having installed thereon appliances for the transmission and receipt of messages by means of wireless telegraphy;

"Station" means a station for the transmission or receipt of messages by means of wireless telegraphy;

"Telegraph" means a wire or cable used for telegraphic or telephonic communication, including any casing, coating, tube, tunnel or pipe enclosing the same, and any posts, masts or piers supporting the same, and any apparatus connected therewith, or any apparatus for transmitting messages or other communications by means of electricity;

"Territorial waters" means the territorial waters of the Commonwealth and those of any territory of the Commonwealth, and includes harbours;

"The Chief Manager" means the Chief Manager, Telegraphs and Wireless, appointed by the Governor-General under the Commonwealth Public Service Act, 1902-1918;

"The Radiotelegraphic Convention" means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder, and includes any modification of the Convention or Regulations from time to time;

"The Secretary" means the Secretary, Postmaster-General's Department;

"Wireless Telegraphy" includes all systems of transmitting and receiving telegraphic or telephonic messages by means of electricity without a continuous metallic connection between the transmitter and the receiver.

PART II—LICENCES: CLASSES AND CONDITIONS.

4. (1) The following classes of licences may be granted and may be evidenced by instruments in accordance with the forms in the schedule to these Regulations:—

- (a) Coast station licences (Form 1);
- (b) Ship station licences (Form 2);
- (c) Land station licences (Form 3);
- (d) Broadcasting station licences (Form 4);
- (e) Broadcasting (receiving) station licences (Form 5);
- (f) Dealers' Licences (Form 6);
- (g) Experimental licences (transmitting and receiving), (Form 7);
- (h) Experimental licences (receiving only) (Form 8);
- (i) Portable station licences (Form 9); or
- (j) Aircraft station licences (Form 10);

(2) Except with the consent of the Defence authorities, a licence (other than a broadcasting (receiving) station licence) shall not be granted to any person who is not a natural-born British

subject or whose father was not a natural-born British subject at the date of that person's birth, or whose mother was at any time a subject of a state with which His Majesty was at war during the war which commenced on the fourth day of August, One thousand nine hundred and fourteen.

(3) A declaration of the secrecy of commercial naval or military wireless communications shall be made in accordance with the form in the Schedule by all persons actually operating a licensed installation, except a broadcasting (receiving) installation, or having access to wireless communications.

(4) Every licence shall be subject to the provisions of any regulations from time to time made under the Wireless Telegraphy Act, 1905-1919, so far as they are applicable to the licence, and those provisions shall be deemed to be incorporated in the licence.

(5) A licensee shall at all times indemnify the Commonwealth of Australia and the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person, in respect of any injury arising from any act of the licensee or his agents permitted by the licence.

(6) Except with the consent in writing of the Minister or an authorised officer, a licensee shall not assign, sublet or otherwise dispose of or admit any other person or body to participate in any of the benefits of the licence, powers, or authorities granted.

(7) Any notice, request, or consent (whether expressed to be in writing or not) to be given or made by or for the Minister may be under the hand of the Secretary or other authorised officer of the Department being administered by the Minister, and may be served by sending the same by registered letter addressed to a licensee at the usual or last-known place or residence or business of the licensee, and in that case the time of service shall be deemed to mean the time when in the ordinary course of post it would have been delivered to the licensee at that place, and any notice to be given by a licensee may be served by sending it by registered letter addressed to the Secretary at his official address within the Commonwealth of Australia.

(8) A licensed installation shall not without the consent of the Minister or an authorised officer be altered or modified in respect of any of the particulars mentioned in the schedule to the licence.

(9) It shall be a condition of the granting of any licence that the licensee shall not—

(a) Transmit any work or part of a work in which copyright subsists except with the consent of the owner of the copyright; or

(b) Send out news or information of any kind published in any newspaper or obtained, collected, collated or co-ordinated by any newspaper, or association of newspapers or any news agency or service except with the full consent in writing, first obtained, of, and upon such payment and conditions as are mutually agreed upon by the licensee and the newspaper, association of newspapers, news agency or service.

(10) Every licensed installation shall be available to the Minister for Defence in case of national emergency.

(11) The issue of a licence by the Minister or an authorised officer under these Regulations shall not relieve the licensee of any responsibility for any infringement by the licensee of any patent for an invention.

5. (1) A coast station licence may be granted in respect of a station, situated in Australia, operated for the purpose of maintaining communication by wireless telegraphy with ship stations, land stations, or other coast stations.

(2) the licensed installation shall be operated by an operator holding the prescribed certificate of proficiency.

(3) The licensee shall transmit messages by means of the licensed installation on equal terms without favour or preference, whether as regards rates of charge, order of transmission, or otherwise:

Provided that signals of distress and messages in connection therewith shall receive priority and that the order of transmission of other messages shall be governed by the International Telegraph Regulations.

(4) In respect of Government messages the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

(5) The licensee or persons employed by him shall, so far as possible, receive from ships and other stations all requests for assistance and all signals of distress, and shall answer those requests and signals and re-transmit them with the least possible delay to the proper authorities by means of the licensed installation or by any other means in the power of the licensee.

(6) The licensee shall keep the full accounts, records, and registers of all messages transmitted by means of the licensed installation.

(7) Each of the messages shall be accompanied in the registers by its identifying number and date, and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister or an authorised officer from time to time reasonably requires to be shown.

(8) Government messages shall be, in the registers, distinguished from other messages.

(9) The licensee shall preserve all used message forms, written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraphic Convention 1912, and in default of any provisions on the subject in the Convention, for such period as is from time to time prescribed by the International Telegraph Regulations and such registers and message papers shall be open to the inspection of the Minister or any authorised officer at the usual or principal place of business of the licensee between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a Statutory or general holiday.

(10) The licensee shall exhibit on the coast station established under his licence a print or copy of the licence certified under the hand of an authorised officer to be a true copy, and also such documents as are directed by the Minister for the purpose of enabling the licensee to communicate with other stations in accordance with the Radiotelegraphic Convention 1912.

(11) The certificate of proficiency issued to operators employed in the coast station shall be available for inspection by authorised officers.

6. (1) A ship station licence shall be granted only in respect of a station or an Australian ship for the purpose of communication with a coast station or other ship station.

(2) Every ship station on an Australian ship shall be operated by an operator holding the prescribed certificate of proficiency.

(3) The licensee shall transmit and receive messages by means of the licensed installation on equal terms without favour or preference, whether as regards rates of charge, order of transmission, or otherwise;

Provided that signals of distress and messages in connection therewith shall receive priority, and that the order of transmission of other messages shall be governed by the International Telegraph Regulations.

(4) The licensee shall, so far as possible, receive from ships and other stations all requests for assistance and all signals of distress, and shall answer those requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed installation or any other means in the power of the licensee.

(5) The licensee shall keep full accounts, records, and registers of all messages transmitted by means of the licensed installation.

(6) Each of the messages shall be accompanied in the registers by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister or an authorised officer from time to time reasonably require to be shown.

(7) In respect of Government messages the licensee shall charge rates not in excess of half the rates charged to the ordinary public.

(8) Government messages shall be in the register distinguished from other messages.

(9) The licensee shall preserve all used message forms, written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraphic Convention 1912, and, in default of any provisions on the subject in the Convention, for such period as is from time to time prescribed by the International Telegraphic Regulations, and the registers and message papers shall be open to the inspection of the Minister or any authorised officer at the usual or principal place of business of the licensee between the hours of 10 a.m. and 5 p.m. on every day, except Sunday or a Statutory or general holiday.

(10) The licensee shall cause to be carried on the ship to which the licence relates a print or copy of the licence certified under the hand of an authorised officer to be a true copy, and also such documents as are directed by the Minister for the purpose of enabling the licensee to communicate with coast stations in accordance with the Radiotelegraphic Convention 1912.

7. (1) A land station licence may be granted in respect of a station for the purpose of communication between the land station and another land or coast station, or such stations as may be approved by the Minister.

(2) The application shall indicate the stations with which it is desired to communicate, and communication with any other station will not be permitted except in cases of distress.

(3) The licensed installation shall be operated by a certified operator or by a competent person who shall be approved by an authorised officer.

(4) Unless specially authorised by the Minister the licensed installation shall not be utilised for conducting commercial traffic constituting competition with the Postmaster-General's telegraph and telephone services.

(5) The licensee shall transmit and receive messages by means of the licensed installation on equal terms without favour or preference, whether as regards rate of charge, order of transmission, or otherwise:

Provided that signals of distress and messages in connection therewith shall receive priority, and that the order of transmission of other messages shall be governed by the International Telegraph Regulations.

(6) The licensee shall keep full accounts, records and registers, of all messages transmitted by means of the licensed installation.

(7) Each of such messages shall be accompanied in the registers by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister or an authorised officer from time to time reasonably requires to be shown.

(8) In respect of Government messages the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

(9) Government messages shall be in the registers distinguished from other messages.

(10) The licensee shall preserve all used message forms, written or printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraphic Convention, and in default of any provisions on the subject in the Convention for such period as is from time to time prescribed by the International Telegraph Regulations, and the registers and message papers shall be open to the inspection of the Minister or any authorised officer at the usual or principal place of business of the licensee between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a statutory or general holiday.

(11) The licensee shall exhibit on the land station established under his licence a print or copy of the licence certified under the hand of an authorised officer to be a true copy, and also such documents as are directed by the Minister, for the purpose of enabling the licensee to communicate with stations in accordance with the Radiotelegraphic Convention, 1912.

8. (1) A broadcasting station licence or broadcasting (receiving) licence or a dealers' licence may be granted in accordance with the provisions of Part IV of these regulations.

9 (1) Experimenting licences shall be of two classes, namely:—

- (a) For transmitting and receiving, and
- (b) For receiving only.

(2) They may be granted to *bona fide* experimenters, radio clubs, institutes, approved by an authorised officer, and for instructional purposes, or for purposes of scientific investigation of wireless telegraphy or wireless telephony phenomena.

(3) The applicant shall:

- (a) Indicate the nature and object of the experiments which he desires to conduct;
- (b) Satisfy an authorised officer of his technical qualifications to conduct experiments scientifically, and to adjust and control any apparatus he proposes to operate;
- (c) If required, submit himself to such examination as an authorised officer directs, the fee for such examination being five shillings; and

(d) Where the application is for a licence to transmit (and in such other cases as an authorised officer decides), be capable of operating at a speed of twelve words (Morse) per minute, sending and receiving, or undertake to have always in attendance when the station is being operated a person who is so capable.

(4) If an applicant is under 21 years of age, the application shall be countersigned by a parent, guardian, or other approved person, who shall be responsible for the observance of the conditions of the licence.

(5) Conditions with regard to wavelengths, power, location of station, and other technical features as are necessary for the protection and

safe working of other stations shall be determined by an authorised officer, and shall not be inconsistent with these regulations.

(6) All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed, and used as not either directly or by reason of the working or user thereof to interfere with the efficient and convenient working of other stations.

(7) An authorised officer may authorise the licensee in writing to operate his licensed installation at an address other than that shown in the licence.

(8) Licensed installations shall be worked solely for the purpose of conducting experiments in wireless telegraphy or telephony for the advancement of science.

(9) Licensed installations shall not be used by licensees or by any other person either on behalf of or by permission of the licensee for the transmission or receipt of messages except messages relating to the experiment in hand as authorised by the licence.

(10) Communication with licensed experimental stations only is permitted.

(11) Licensed installations shall be so worked as not to interfere with the working of any wireless telegraph or telephone station established in Australia by or for the purposes of the Minister or any department of the Commonwealth of Australia, or for commercial purposes, and in particular with the transmission or receipt of any messages between or at such wireless telegraph or telephone stations on land and wireless telegraph or telephone stations established on ships at sea. On no account shall His Majesty's ships be called by means of the licensed installation.

(12) The licensee shall not (either by himself or by any person acting on his behalf or by his permission), by the transmission of any message by means of the licensed installation or otherwise by the use of the licensed installation interfere with naval or military signalling.

(13) The provisions of the last preceding sub-regulation shall be construed to be without prejudice to the generality of any other provisions of these regulations.

(14) An authorised officer may grant a temporary permit for a demonstration of wireless telegraphy or telephony in connection with lectures, entertainments, or any such proceeding calculated to assist the development or public appreciation of the art.

(15) It shall be a condition of the licence that the licensee shall not purchase or otherwise obtain any wireless apparatus for any purpose other than for the conduct of experiments as authorised by the licence.

10. (1) A portable station licence shall be granted only in special cases within the discretion of the Minister or an authorised officer.

(2) In no case will it be permissible to transact, by means of the station, business which constitutes competition with the Postmaster-General's telegraph or telephone services, or commercial wireless services.

(3) The licensee shall be a holder of an operator's certificate of proficiency, or the station shall be operated by a person certified by an authorised officer as being competent to operate the station efficiently.

(4) The applicant shall state the station or stations he desires to communicate with, and communication with no other station or stations will be permitted except in cases of distress.

11. (1) An aircraft station licence shall be issued in respect of a station installed on aircraft for purposes of communication with other authorised stations.

(2) The station shall be operated by a competent person authorised by an authorised officer.

(3) The applicant shall state the station or stations with which it is desired to communicate normally.

12. (1) A licence other than a broadcasting station licence shall be for a period of one year from the date thereof, and may be renewed from time to time, the renewal date being the first day of the month in the year of renewal corresponding to the month in which the licence was granted.

(2) A broadcasting station licence shall be for such periods and shall be renewable as provided in Part IV of these Regulations.

13. (1) The following fees shall be payable for each year or portion of a year during which any licence is in force:—

- (a) For a coast station licence, one pound;
- (b) For a ship station licence—one pound;
- (c) For a land station licence—one pound;
- (d) For a broadcasting station licence—fifteen pounds.

(e) For a broadcasting (receiving) station licence—the fee provided in Division II of part IV of these Regulations.

- (f) For a dealer's licence—one pound;
- (g) For an experimental licence (transmitting and receiving)—one pound;
- (h) For an experimental licence (receiving only)—ten shillings.

(i) For a portable station licence—one pound.

(j) For an aircraft station licence—one pound.

Provided that the Minister may grant any licence free of charge to Amalgamated Wireless (Australasia), Limited, pursuant to the agreement made on 28th March, 1922, between the Commonwealth and Amalgamated Wireless (Australasia), Limited.

(2) The fees under this regulation shall be paid in advance.

(3) If a transmitting licence is issued to the holder of a receiving licence, an additional fee at the rate of 2s. 6d. per quarter or portion thereof shall be charged during the currency of the receiving licence.

14. (1) Before any licence is granted, the applicant shall satisfy the Minister or an authorised officer that the wireless telegraphy apparatus, or appliances to be worked in pursuance of the licence comply with the regulations for the time being in force governing syntony and wavelength.

(2) The transmitting apparatus used on the licensed stations shall be of such a character that the waves emitted are as pure and little damped as possible, and the receiving apparatus used at licensed stations shall be of such a character as to afford the greatest possible protection from disturbance during reception of signals.

15. Notwithstanding anything contained in any experimental licence granted prior to the making of these Regulations, neither the holder of any licence other than a broadcasting (receiving) licence nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Commonwealth of Australia or a competent legal tribunal), or make any use whatever of any message coming to the knowledge of the licensee or any such person by virtue of the licence. See also Regulation 4 (3).

16. (1) Every licence (except a ship licence or broadcasting (receiving) licence) shall be made out in duplicate.

(2) A ship licence shall be in three parts, two parts shall be issued to the licensee and the other retained in the department.

(3) One part of the licence shall be exhibited in the room where the licensed apparatus is installed. In the case of a portable station or an aircraft station, a card in accordance with the form in the schedule shall be carried.

17. (1) A licence may be renewed by the issue of a fresh licence or by writing thereon or attaching thereto a memorandum stating the period for which it is renewed signed by the Minister or an authorised officer.

(2) The memorandum shall be written on each part of the licence, but in the case of the licensee's part, it shall be in the form of an official receipt for the renewal fee signed by the Minister or an authorised officer or by any person authorised to receive moneys on behalf of the department.

(3) The receipts shall be attached by the licensee to the part or parts of the licence in his possession.

18. (1) The Minister may, by notice in writing revoke and determine any licence, on the ground of the licensee having failed to comply with any regulation for the time being in force under the Act or with any condition of the licence or any other ground specified in the licence.

(2) The licensee shall not be entitled to any compensation by reason of any such revocation or determination.

19. Licences issued by the Prime Minister or the Minister for the Navy and in force at the date of the commencement of these Regulations shall continue as if issued in pursuance of these Regulations.

PART III.—APPLICATIONS FOR LICENCES.

20. An application for a coast station licence shall be in writing and contain the following particulars:—

- (a) Name of station.
- (b) Latitude and longitude.
- (c) Source of power and maximum power taken by transmitter.
- (d) Normal range in nautical miles; (a) by day, (b) by night.
- (e) System of Wireless Telegraphy to be used, with characteristics of the system of emission.
- (f) Type of aerial.
- (g) Wavelengths (in metres) of transmitter.
- (h) Nature of services performed.
- (i) Hours of service; and
- (j) Coast station charge.

21. An application for a ship station licence shall be in writing and contain the following particulars:—

- (a) The name of the ship in respect of which the licence is applied for.
- (b) The port in Australia at which the ship is registered.
- (c) Route or service in which engaged.
- (d) Number of normal crew carried.
- (e) Number of passengers as per passenger certificate.
- (f) Number of operators and watchers.
- (g) Hours of service.
- (h) Gross tonnage.
- (i) The system of wireless telegraphy to be used on the ship.
- (j) Normal range of signalling in nautical miles; (a) by day, (b) by night.
- (k) Description of transmitting apparatus including spark frequency and type of discharger.
- (l) Description of receiving apparatus.
- (m) Wavelengths (in metres) of transmitter.
- (n) Source of and maximum power.

(o) Maximum power taken by transmitting apparatus in amperes and volts.

(p) If alternator is used, number of cycles per second.

(q) Particulars of emergency apparatus showing primary power in volts and amperes and source of energy (capacity of storage battery to be stated if employed); and

(r) Ship station charge.

22. An application for a land station licence shall be in writing and contain the following particulars:—

(a) The locality of the station, in respect of which the licence is applied for.

(b) The name of the owner of the property on which the station is situated and whether the applicant is owner or lessee.

(c) A description of the system of wireless telegraphy to be used (transmitter and receiver), including source of power and maximum power taken by transmitter.

(d) Type of aerial.

(e) Wavelengths (in metres) of transmitter.

(f) Source of and maximum power.

(g) Maximum power taken by transmitter.

(h) Name of station or stations with which it is desired to communicate.

(i) Normal range of signalling (in miles); (a) by day, (b) by night, and

(j) Charges for service.

23. An application for a broadcasting station licence shall be made as provided in Regulation 29 of these Regulations.

24. An application for an experimental licence shall be in writing and set out the following particulars:—

(a) Name in full, age, address, technical training or qualifications, present occupation, nationality and the parents' nationality,

(b) If the applicant is under 21 years of age the application shall be countersigned by a parent, guardian, or other approved person.

(c) The scientific, technical, practical or other grounds upon which it is desired to obtain a licence.

(d) Complete diagram of connections and description of the apparatus it is intended to use, and

(e) A statutory declaration regarding the secrecy of wireless communications.

25. An application for a portable station shall be in writing and shall set out the following particulars:—

(a) Name and address of applicant.

(b) The purposes for which the proposed station is to be utilised.

(c) The area within which it is proposed to transport and operate the station.

(d) The station or stations with which it is desired to communicate.

(e) Complete description (with diagram of connections) of the apparatus to be utilised in the proposed station; and

(f) A statutory declaration regarding the secrecy of wireless communications.

26. An application for an aircraft station licence shall be in writing, and shall set out the following particulars:—

(a) Name and address of applicant.

(b) Nature of service on which aircraft is engaged.

(c) Description of system of wireless telegraphy to be utilised.

(d) Normal range of signalling in miles—(a) by day, (b) by night.

(e) Wavelength of transmitter.

(f) Source of power and maximum power taken by transmitter.

(g) Station with which it is desired to communicate, and

(h) A statutory declaration regarding the secrecy of wireless communication.

27. Before granting any licence the Minister or an authorised officer may require the applicant to furnish such additional particulars as he thinks necessary.

PART IV—BROADCASTING.

DIVISION I, BROADCASTING STATIONS.

28. Except where any inconsistency exists nothing in this part shall affect the generality of the provisions of the other parts of these regulations.

29. An application for a broadcasting station licence shall be in writing, and shall contain the following particulars:—

(a) Name and address of applicant.

(b) Technical qualifications of applicant or the persons who it is proposed will operate the licensed installation. (Where the applicant does not possess the necessary qualifications and proposes to engage an expert to control the station after the issue of the licence, this should be stated).

(c) Registered title of the company on behalf of which application is made, or, in the case of an application from a private individual particulars of financial stability.

(d) Location of proposed station.

(e) Type of transmitter and character of modulation proposed.

(f) Maximum power of transmitter (in high frequency generator circuit).

(g) Type of aerial and natural wavelength.

(h) Wavelength desired for broadcasting.

(i) Hours of service.

(j) Class of service to be broadcasted and

(k) Circuit diagram of transmitter and receiver.

30. (1) A broadcasting station licence* in accordance with Form 4 in the schedule to these Regulations may be granted in respect of a station operated for the purpose of transmitting to broadcasting (receiving) licensees.

(2) The licence shall be prepared in duplicate, one copy to be retained by the department and the other to be issued to the licensee and to be available for inspection by authorised officers.

(3) The licence shall not be transferable, nor the location of a licensed station changed without the approval of the Minister.

31. (1) A broadcasting station licence shall continue in force for a period of five years from the date of granting, and shall be renewable annually thereafter.

(2) The fee payable for such a licence shall be fifteen pounds per annum payable in advance.

32. (1) A broadcasting station licence may be granted only to an applicant who produces evidence to the satisfaction of the Minister of financial and technical capability to provide and maintain a reliable broadcasting service.

(2) A licensee shall, within one month after the issue of the licence, give an undertaking, supported by a financial guarantee of one thousand pounds approved by the Minister, to commence the broadcasting service within six months, or such extended time not exceeding six months, as the Minister may decide, after the date of the issue of the licence, and to maintain the service to the satisfaction of the Minister for a period of five years.

(3) If the licence be renewed at the termination of that period, a similar undertaking and a similar guarantee shall be required in respect of the period covered by the renewal.

33. (1) The broadcasting station shall be operated at the power and wavelength shown in the licence, subject to such alterations as the Minister directs, or the Minister or an authorised officer permits.

(2) The power shall be rated in watts, measured in the high-frequency generator circuit of the transmitting apparatus.

(3) The licensee may apply for the use of any power between 500 and 5,000 watts, which shall be fixed at the Minister's discretion.

(4) The power rating and the circuit arrangements indicated in the licence shall not be altered without the permission of the Minister or an authorised officer.

34. (1) The transmitting apparatus shall be equipped with a tuned circuit coupled to the aerial, and shall be so designed as to maintain reasonably constant radiation during periods of operation, and shall be as free as possible from injurious harmonics.

(2) It shall be controlled in such a manner as to minimise the risk of interference with other stations.

(3) A maximum variation of one per centum above or below the licensed wavelength shall be permitted.

(4) Provision shall be made at the station for a wavelength indicating instrument or the equivalent to be available.

35. (1) Each licence shall be issued for the use of a particular wavelength selected from bands available for broadcasting between 250 and 3,500 metres.

(2) The Minister shall determine the wavelength to be used, and the wavelength shall not be altered except by the direction of the Minister, or except with the permission of the Minister or an authorised officer.

(3) The Minister shall determine the number of wavelengths to be used at any centre.

(4) When the number of approved applications exceeds the number of approved wavelengths available for a particular centre, the matter shall be determined by ballot at the discretion of the Minister as between the parties affected.

36. The Minister reserves the right to curtail the hours of broadcasting at any time if found advisable in the public interest.

37. (1) The licensee shall include in the programme to be broadcasted such items of general interest, and shall broadcast them in such manner as the Minister stipulates from time to time.

(2) The volume of stipulated items shall not be such as to entail a period of occupation of the broadcasting station in excess of thirty minutes in each consecutive period of twelve hours.

(3) All matter broadcasted shall be subject to such censorship as the Minister determines.

38. The licensed installation shall be operated by a certificated operator who shall sign a declaration of secrecy of wireless communications.

39. The licensed installation shall include receiving apparatus of a type which will not cause the aerial to oscillate.

40. Re-broadcasting shall only be permitted with the consent of the licensee of the original broadcasting station, and then only on such conditions as are determined by the Minister or an authorised officer.

41. The licensed installation shall be open at all reasonable times to inspection by authorised officers, and every reasonable facility shall be given for ascertaining the condition of the station, and whether these Regulations are being complied with.

42. (1) The broadcasting station shall be connected by telephone with the public telephone exchange system, the centre in which the broadcasting station is located.

(2) The broadcasting station licensee shall enter into the usual telephone subscribers agreement for the establishment of the service.

43. Any licensee of a broadcasting station who is authorised to issue broadcasting receiving licenses, shall execute the provisions of these Regulations relating thereto.

DIVISION II.

BROADCASTING (RECEIVING) STATIONS.

44. (1) A broadcasting (receiving) licence in accordance with Form 5 in the Schedule to these Regulations may be issued to any person on payment of the annual licence fee of 10s., together with the annual subscription payable to the broadcasting station licensee.

(2) Broadcasting (receiving) licences shall be prepared in triplicate, and shall be numbered consecutively.

(3) The department may supply books of forms to broadcasting station licensees, who shall be responsible for the issue of the licences and collection of the licence fees and any amount payable in respect of the issue of the licences shall be recoverable from the broadcasting station licensee as a debt due to the Crown.

(4) A broadcasting station licensee or any agent or employee of the licensee shall issue the original copies of the licences to the licensees retaining the triplicate copies, and once a month forward the duplicate copies, together with the licence fees, to the department.

45. (1) The broadcasting (receiving) licence will be issued for one year, and shall be renewable on payment of the annual licence fee from the first day of the month in the year of renewal corresponding to the month in which the licence was issued.

(2) The licence shall not be transferable.

(3) A broadcasting (receiving) licensee shall not transfer or otherwise dispose of the licensed installation to any person other than to a person holding a broadcast (receiving) licence.

46. (1) The receiving apparatus which may be purchased or hired for use by a broadcasting (receiving) licensee shall be of a type approved by the Minister or by an authorised officer. It shall bear a stamped indication of such approval in the following form :—

<p>BROADCASTING RECEIVER Approved by P.M.G. Type No..... metres.</p>
--

(2) Approved broadcasting receivers shall be so constructed as to respond to the wavelength indicated on the stamped indication, or to any wavelength not differing more than 10 per centum from that specified. The receivers shall not respond to wavelengths outside the specified limits.

(3) No receiving apparatus shall contain a valve or valves so connected as to be capable of causing the aerial to oscillate.

(4) For the purpose of approving any type of receiving apparatus the Minister or authorised officer shall not have regard to the method of construction of the apparatus, but shall have regard only to reaction and the wavelength to which the receiver will respond without alteration.

(5) All apparatus bearing the stamp referred to in sub-Regulation (1) of Regulation 46 of these Regulations shall bear a seal approved by the Minister.

(6) No person, except an authorised officer, the maker, or an accredited agent, shall break or interfere with the seal. He shall re-affix it before returning the apparatus to the control of the licensee.

47. (1) Tests of sets may be made by authorised officers for the production of oscillations in the aerial and for interference properties with a factor of safety, *i.e.*, increasing the anode battery by about 30 per centum, changing valves or other essential parts of the apparatus but not by altering any soldered connections.

(2) After approval of a type set the type shall be given a registered number, and makers, accredited agents or users (in case of sets made by the users), shall see that all sets comply with the approved type before they are sold or used.

(3) The unit or set approved as a pattern instrument for an approved type shall be retained by the maker or accredited agent without alteration.

(4) No change in the design or circuit arrangements affecting wavelength and reaction characteristics of an approved type shall be made without the previous sanction of an authorised officer.

48. The approval of the Minister or an authorised officer does not carry any implied guarantee of quality, workmanship, or sensitivity of the apparatus, and shall not render the Minister or any authorised officer liable or responsible for any infringement of a patent for an invention by any licensee, or by any maker, vendor, purchaser or user of the apparatus.

49. All sets other than those assembled by their users shall bear the stamped indication referred to in Regulation 46 of these Regulations, together with the type, number and wavelength.

50. (1) An authorised officer shall have the right at any time to select any apparatus available for disposal or actually disposed of to a broadcasting (receiving) licensee to determine whether it be in conformity with the approved type.

(2) In the case of sets which, as the result of tests, are found not to comply with the provisions of Regulation 46 of these Regulations, the authorisation of the future sale or hire of that class of set may be cancelled by the authorised officer; and any other similarly defective sets, which have been disposed of to licensees shall be modified at the vendor's expense to conform with these Regulations.

(3) The vendor may appeal to the Minister, who may affirm or revoke the cancellation.

(4) Similar sets hired out shall be withdrawn from service, until they are altered so as to conform with these Regulations.

51. No standard aerial is prescribed, but tests, made by the officers of the department to determine conformity with Regulation 46 of these Regulations, shall be made on an elevated aerial 100 feet long.

52. (1) Licensees who propose assembling or who have assembled parts into receiving sets shall arrange their receivers in conformity with requirements of Regulation 46 of these Regulations to the satisfaction of the Minister or an authorised officer.

(2) The tuning elements of the receivers shall be assembled and enclosed in a box or case suitable for effective sealing.

(3) The box or case containing the tuning elements shall be submitted to an authorised

officer, who will ascertain by test whether Regulation 46 of these Regulations is complied with.

(4) A charge of 2s. 6d., payable in advance, shall be made for each test.

(5) If the set complies with Regulation 46 of these Regulations the box or case containing the tuning element shall then be sealed and returned to the licensee, together with a certificate of such compliance.

(6) A copy of the certificate shall be forwarded by the authorised officer to the broadcasting station licensee concerned.

53. (1) A licensee who desires to receive at the same address from more than one broadcasting station may have separate receivers, or may have his receiver altered so as to respond to the wavelength of the other station or stations.

(2) The alterations to the receiving apparatus shall be made in conformity with the requirements of Regulation 46 of these Regulations.

(3) In case of any such multi wavelength reception the subscription to all the broadcasting stations concerned shall be paid to the respective broadcasting station licensees, and the broadcasting receiving licence fee shall be £1 per annum, provided that the installations so licensed are operated by the same address.

54. (1) Where a broadcasting (receiving) licensee desires to remove the licensed installation to a new address which is not at a greater distance than twenty miles radially from the original address, permission shall be obtained from the broadcasting station licensee concerned for the operation of the licensed installation at the new address.

(2) The broadcasting station licensee shall notify the Department monthly of all changes of address so authorised.

(3) A temporary removal shall be dealt with in the manner indicated in sub-Regulation (1) of this Regulation, but notification to the Department of the change of address is not required unless the period to be covered exceeds three months.

(4) Removal of a licensed installation to any address at a distance greater than 20 miles radially shall not be made without the consent of the Minister or an authorised officer.

55. All licensees shall permit authorised officers or approved employee of the broadcasting station licensee whose programmes they receive, thereto authorised by him, to inspect, at any reasonable time in the daytime, licensed installations and shall provide all reasonable means for such inspections.

56. A broadcasting (receiving) licensee shall not operate his licensed installation, or permit it to be operated, for profit, without the consent of the broadcasting station licensee.

DIVISION 3.—SALE OF BROADCASTING (RECEIVING) APPARATUS.

57. (1) The Minister may grant a dealer's licence in accordance with Form 6 in the schedule to these Regulations permitting any person, firm, or company, to sell or let on hire or otherwise dispose of complete broadcasting receivers or parts comprising the complete tuning element of those receivers.

(2) A licence shall be granted in respect of a particular address of the licensee and shall not be exercised in respect of any other address without the consent of the Minister or an authorised officer.

(3) A licence is not transferable.

(4) The licensee shall exhibit a notice on his premises as follows: "Licensed Radio Dealer."

58. The fee for the granting or renewal of a licence referred to in the last preceding Regulation shall be one pound payable in advance.

59. No person, firm, or company, shall sell or let on hire or otherwise dispose of any apparatus referred to in Regulation 57 of these Regulations to any person, unless he or it is satisfied that he holds a broadcasting (receiving) licence or an experimental licence.

60. Any person, firm or company, who deals in the apparatus referred to in Regulation 57 of these Regulations, shall keep a record of the sales, hirings and disposals of that apparatus and shall permit any employee of a broadcasting station licensee thereto authorised in writing by the licensee to inspect the record at any reasonable time.

PART V.—WORKING OF STATIONS.

61. The provisions of the Radiotelegraphic Convention and the Service Regulations for the time being in force thereunder, so far as such convention and Regulations are applicable, shall apply to all wireless telegraphy installations available for the transmission or receipt of messages or wireless communications, whether installed by the commonwealth or under licence and to all messages handled by those installations and every licensee shall comply therewith.

62. (1) In cases of ship stations, there shall be a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this regulation as to emergency installations as well as those to normal installations, a normal installation alone will suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least one hundred nautical miles by day under normal conditions and circumstances.

(3) An emergency installation must include an independent source of energy, capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of eighty nautical miles for ships of class I as defined in Navigation (Wireless Telegraphy) Regulations 1921 (being Statutory Rules 1921, No. 104, as amended from time to time), and fifty nautical miles for ships of classes II and III as so defined, and the independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power from the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this Regulation an installation shall be deemed to comply with the requirements of the last preceding sub-Regulation as to range if it is able to maintain communication on a 600 metre wave at a range of one-and-a-half times the number of nautical miles hereinbefore respectively prescribed over sea by day with a coast station when employing a receiver without amplification devices.

63. When communications are made by means of wireless telegraphy between a ship (whether Australian, British or Foreign) in territorial waters and a coast station, the rules in force for the working of wireless telegraphy at the coast station shall be observed.

64. (1) The waves emitted by any station licensed in Australia must be as little damped as possible and in no case shall the logarithmic decrement of a complete oscillation exceed two-tenths except when sending distress signals or messages relating thereto.

(2) The coupling between the primary and secondary of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent between the mean wavelength and either of the two waves emitted by the coupled circuits.

65. All vessels licensed under the Act which are fitted with wireless telegraphy installations, and which trade in the territorial waters of the Commonwealth or adjacent Islands under Commonwealth control shall be equipped with tuned crystallite receivers or receivers of the thermionic valve type of such a character as to afford the greatest protection from interference during the reception of signals.

66. A reasonable number of such spare parts of both the main and emergency apparatus as are subject to undue wear or deterioration and one extra pair of head telephones, extra cords, extra detectors, battery testing instruments, and distilled water shall always be available in ship stations.

67. Power for the operation of the main equipment shall be available on all vessels licensed in Australia during the periods of watches maintained in accordance with Schedule I of the licence or the Navigation (Wireless Telegraphy) Regulations (being Statutory Rules 1921, No. 104, as amended from time to time).

68. (1) The master of a vessel shall have the right to censor all messages addressed to or transmitted by a station on board the vessel under his control, but the master shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to his knowledge through the exercise of the censorship, nor shall the master nor any operator divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message (other than a message of distress) coming to his knowledge, and not intended for the said station.

(2) Any master or person employed on a ship having access to wireless messages shall make a Statutory declaration regarding the secrecy of wireless communications.

69. (1) The wireless telegraphy appliances on board any ship (whether Australian, British or Foreign) in the territorial waters or in any station shall be worked in such a way as not to interrupt or interfere with; (a) naval or military signalling; or (b) the transmission of messages between wireless telegraph stations.

(2) In this regulation "naval or military signalling" includes signalling or communicating by means of any system of wireless telegraphy by the King's Imperial or Dominion Naval or Military forces.

(3) Prompt compliance with any instructions or standard code signal transmitted by Commercial or Defence stations indicating that all experimental transmitting stations must cease operating for a stated period shall be given by all licensees of experimental or portable stations.

70. (1) The transmission of superfluous signals by any station is absolutely prohibited; trials and practices are forbidden, except under such circumstances as to preclude the possibility of interference with other stations.

(2) No person shall transmit or make a signal containing profane words or language or transmit improperly the call sign of another station or any signals not necessary for the conduct of experiments or traffic.

71. Except by permission of the Minister or persons authorised by him the wireless telegraphy appliances on board any Australian ship British ship, or foreign ship (other than a ship of war) shall not be worked or used while the ship is moored to any wharf or pier in Australia.

Provided that any ship anchored or moored in accordance with the provisions of the "Quarantine Act," 1908-1920, or any regulations thereunder may use wireless apparatus for the purpose of communication with a coast station when no alternative method of electrical communication is available.

72. The Minister or any person authorised in writing by the Minister or the Controller may, at all reasonable times, enter upon any station on which wireless telegraphy appliances are installed, or are in course of being installed in pursuance of a licence; and may examine or test the appliances and the working and user thereof. See also Regulation 87.

PART VI.—CONTROL OF COMMUNICATIONS AND APPLIANCES IN EMERGENCIES.

73. (1) In cases of emergency, of which the Minister shall be the sole judge, the Minister or any authorised officer or the Naval Board or any officer in command of any ship of war of His Majesty's Navy (whether Imperial or Dominion), or any officer in command of any part of the Defence Force, may—

(a) Take possession of any wireless telegraph appliances installed on any station in pursuance of a licence, and use such appliances for the King's service; or

(b) Place any person in control of any such appliances; or

(c) Direct the licensee or person in charge of the appliances to submit to him all or any of the messages tendered for transmission or receive by means of the appliances; or

(d) Stop or delay or direct the licensee or person in charge of the appliances to stop or delay the transmission or delivery of any such messages or to deliver them to him; or

(e) Direct the licensee or person in charge of the appliances to comply with all such directions as he thinks fit to give with reference to the transmission or receipt of messages by means of the appliances.

(2) Every licensee and every person in charge of any wireless telegraphy appliances installed in pursuance of a licence shall comply with this Regulation and all directions issued in pursuance thereof.

(3) Reasonable compensation shall be payable to the licensee for any damage to the appliances arising in consequence of the exercise of the powers conferred by this Regulation.

(4) The Minister may, notwithstanding anything contained in a licence, issue to a licensee under these Regulations by order published in the *Gazette* prohibit for such time as he directs any licensee from communicating with any station licensed by or belonging to or in any country which is at war with His Majesty the King or the possessions thereof.

(5) Any order under paragraph (e) of sub-Regulation (1) of this Regulation may prohibit all communications whatever, or may prohibit communications to particular stations or under special circumstances.

74. (1) The use of wireless telegraphy appliances on board any foreign ship of war while in any harbour in Australia shall be subject to such rules (whether prohibitive or regulative) as the Governor-General thinks fit to make.

(2) If at any time an emergency has arisen in which it is expedient that the Commonwealth Government should have control over the transmission of all messages by wireless telegraphy, the Governor-General may, by notice in the *Gazette*, prohibit for such period as he thinks necessary the use of wireless telegraphy on board foreign ships in territorial waters.

PART VII.—PROFICIENCY CERTIFICATES FOR OPERATORS AND WATCHERS.

75. Every ship station and coast station in respect of which a licence is issued shall be operated by a person or persons holding a certificate of proficiency in accordance with the form in the schedule or certificates of proficiency issued after examination by the Minister or person authorised in that behalf by the Minister or by the Postmaster-General of the United Kingdom, or by the proper authority in any part of the British Empire.

76. Certificates of proficiency shall be issued to candidates over 18 years of age who have passed an examination which shall include the requirements of Article 10 of the Service Regulations appended to the International Radiotelegraphic Convention, and the "Handbook for Wireless Telegraph Operators" issued by the Postmaster-General of the United Kingdom.

77. The certificate shall be of two classes, namely:—

(a) First class indicating a satisfactory knowledge with regard to

(1) The adjustment of the apparatus and the working thereof.

(2) Transmitting and receiving by sound at a speed which must not be less than 20 words per minute (five letters being counted as one word); and

(3) The regulations applying to the exchange of radiotelegraphy communications; and

(b) Second class, indicating a satisfactory knowledge with regard to

(1) The adjustment of the apparatus and the working thereof;

(2) Transmitting and receiving by sound at a speed of 12 to 19 words per minute (five letters being counted as one word); and

(3) The regulations applying to the exchange of radiotelegraphy communications.

78. (1) A fee of 10s. shall be paid by the candidate on each occasion on which the candidate is examined.

(2) A certificate of proficiency may be issued at a charge of 5s. to each candidate who satisfactorily passes the prescribed examination, and in the event of a certificate being lost a fee of 10s. shall be paid for the first copy of the certificate, £1 for the second copy, and £2 for any subsequent copy.

Provided that the Minister may authorise the issue of a duplicate or copy of a certificate without charge where it is shown that the original certificate has been lost or destroyed in circumstances over which the holder has no control.

79. In case of failure, a candidate shall not ordinarily be re-examined in any system until the lapse of three months.

80. If a person to whom a certificate of proficiency has been issued by the Minister—

(a) Is convicted of a criminal offence; or

(b) Is, on account of incompetence, or for any other reason, considered by the Minister to be unsuitable to continue to hold the certificate,

the Minister may withdraw, cancel or suspend the certificate.

81. Certificates of proficiency issued by the Prime Minister or the Minister for the Navy and in force at the date of the commencement of these Regulations, shall continue in force as if issued in pursuance of these Regulations.

82. The certificate of proficiency held by each operator shall be exhibited in the operating room in respect of stations at which he is serving or shall be readily available for inspection by authorised officers.

83. (1) Every person acting as a Wireless telegraphy watcher in accordance with the provisions of Section 231 of the "Navigation Act," 1912-1920, shall hold a certificate of proficiency as a watcher in accordance with the form in the schedule issued by the Minister or person authorised in that behalf by the Minister, or by the Postmaster-General of the United Kingdom or by the proper authority in any part of the British Empire, certifying that the holder is capable of receiving and understanding the radiotelegraph distress signal and the alarm signal, and has sufficient knowledge of the apparatus on which he will be required to keep watch to know by means of a buzzer or other similar test that it is in proper condition to receive signals

(2) A certificate of proficiency as a watcher shall not be issued to any person under 16 years of age

(3) A fee of 5s. shall be paid by the candidate on each occasion on which he is examined.

84. (1) Except with the consent of the Defence Authorities a certificate of proficiency in accordance with Form 11 or 12 in the Schedule to these Regulations shall not be granted to any person who is not a natural-born British subject, or whose father was not a natural-born British subject at the date of that person's birth, or whose mother was at any time a subject of a state with which His Majesty was at war during the war which commenced on the fourth day of August, One thousand nine hundred and fourteen.

(2) In case of emergency a special certificate may be granted to watchers of other than British nationality for one voyage only.

PART VIII.—MISCELLANEOUS

85. Nothing in these Regulations shall be construed as rendering the Minister liable or responsible for any infringement by licence in the exercise of his licence of copyright in any work or of any patent for an invention, or for any breach of the law arising out of the exercise of the licence, and nothing in these Regulations shall affect the liability of the licence in respect of any such act done by him.

86. These Regulations shall not prevent the use, without licence, by the Defence Authorities of wireless telegraphy for Defence purposes:

Provided that each wireless telegraphy installation (other than a mere temporary installation) to be used shall be authorised in writing by the Minister.

87. If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraphy station has been established or that an apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within his jurisdiction without a licence in that behalf, he may grant a search warrant to any police officer or officer appointed in that behalf by the Minister or authorised officer and named in the warrant, and the warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship

and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

88. (1) In this Regulation "detained appliances" means an appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy which was taken into possession or controlled by or on behalf of the Commonwealth during the existence of the state of war which commenced on the fourth day of August, one thousand nine hundred and fourteen.

(2) Any detailed appliance may be returned to a person who satisfies the Minister or any officer authorised by the Minister that he is entitled to delivery of the appliance.

(3) Notification may be given in the *Gazette* or by registered post to the person from whom the detained appliance was received requiring him to attend at the place where the appliance is stored and to take delivery thereof within a time fixed by the notification.

(4) If a person entitled to delivery fails to remove the appliance within the time specified in the Notice, or if the Minister or the officer authorised by the Minister is satisfied that any person so attending is not entitled to delivery thereof the appliance may be sold either by public auction or private contract at the owner's risk.

(5) The net proceeds of the sale after deduction of all expenses of sales may be paid to any person who satisfies the Minister that he is entitled to the net proceeds.

89. Any person who acts in contravention of any provision of these Regulations or fails to comply with any condition of a licence, shall be guilty of an offence against these Regulations.

Penalty fifty pounds.

90. (1) The Wireless Telegraphy Regulations 1922 (being Statutory Rules 1922, No. 169), and the Telegraph (detained appliances) Regulations (being Statutory Rules 1921, No. 190), are hereby repealed.

(2) Notwithstanding the repeal of the Wireless Telegraphy Regulations 1922, the rates in force by virtue of those Regulations immediately prior to the repeal shall, subject to any alteration made in pursuance of the agreement made on the 28th of March, 1922, between the Commonwealth of Australia and Amalgamated Wireless (Australasia), Ltd. be the rates to be charged for messages transmitted or received by wireless telegraphy within the Commonwealth or between the Commonwealth and any territory under the authority of the Commonwealth or between any such territories.

THE SCHEDULE.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

"WIRELESS TELEGRAPH ACT" 1905-1919 COAST STATION LICENCE.

C In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Section 5 of the Wireless Telegraphy Act 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to M. to erect a wireless coast station at and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said station shall be carried out in accordance with the provisions of the said Regulations as amended

from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorised in writing by the Postmaster-General.

By direction of the Postmaster-General.

Chief Manager, Telegraphs and Wireless.
Date

SCHEDULE OF THE AUTHORISED STATION.

1. No. of licence.
2. Name of station.
3. Latitude and longitude.
4. Call Sign.
5. Source of power and maximum power taken by transmitter.
6. Normal range in nautical miles; (a) by day, (b) by night.
7. System of radio telegraphy with the characteristics of the system of emission.
8. Type of aerial.
9. Wavelength in metres (the normal wavelength is underlined).
10. Nature of services performed.
11. Hours of service.
12. Charge per word for traffic.

Signature of licensee.

Date

COMMONWEALTH OF AUSTRALIA.

"WIRELESS TELEGRAPHY ACT" 1905-1919. Form 2.

D SHIP STATION LICENCE.

Dated 19

To all to whom these Presents shall come I the Honourable the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919, send greeting.

Whereas, of in the State of (hereinafter called the licensee) is desirous of establishing, erecting, maintaining, and using on the called belonging to the licensee appliances for the purpose of transmitting and receiving messages by means of wireless telegraphy;

And whereas by reason of the provisions of the Telegraph Acts, 1863 to 1907, of the United Kingdom, and the Wireless Telegraphy Order, 1908, of the United Kingdom, it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any British ship (whether in the territorial waters of the British Islands or on the high seas), except under and in accordance with a licence granted in that behalf by the Postmaster-General of that Kingdom:

Provided that a person on board a British ship which is registered in any British possession (other than the Channel Islands and the Isle of Man), or in any British Protectorate, shall not be deemed to permit an offence against the Wireless Telegraphy Act, 1904, of the United Kingdom by reason of the installation and working of wireless telegraphy in such ship if the authority in such possession or protectorate, having power by law so to do, shall have granted a licence for the installation and working of apparatus for wireless telegraphy on that ship, and if such person is acting in accordance with the provisions of such licence:

And whereas the ship in respect of which this licence is granted is registered in the Commonwealth:

And whereas by the Wireless Telegraphy Act, 1905-1919, of the Commonwealth of Australia, it is enacted that licences to establish, erect, maintain, and use stations and appliances for the purpose of transmitting or receiving messages by means of wireless telegraphy may be granted by the Minister for the time being administering the Act for such terms and on such conditions and on payment of such fees as are prescribed :

And whereas the licensee has made application for this licence and has paid the prescribed fee payable in respect thereof :

Now I

the Minister or member of the Executive Council for the time being administering the Wireless Telegraphy Act, 1905-1919, aforesaid in pursuance of the Wireless Telegraphy Act, 1905-1919, and in exercise of all powers and authorities enabling me in this behalf to hereby grant to the licensee during the term or period commencing on the day of 19 ,
and terminating on the day of 19 ,
licence and permission—

(1) To establish, erect and install and maintain, work and use for the purposes hereinafter mentioned at the ship station specified in the first schedule hereto appliances or apparatus for wireless telegraphy of the kind used in the system known as the system of wireless telegraphy (which apparatus is hereinafter referred to as "the licensed installation") provided that

(a) Each ship station shall be of such class mentioned in Article XIII of the Service Regulations annexed to the Radiotelegraphic Convention, 1912, as is specified in the said schedule opposite to the name of such station ;

(b) The installation installed shall be of the character specified in the said First Schedule ;

(c) A complete scheme of the connections intended to be employed shall be supplied by the licensee ;

(d) The transmitting installation used on the ship station shall be of such a character that the waves emitted are as pure and little damped as possible and the receiving apparatus used at the said station shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals ;

(e) The licensed installation shall be so constructed as to be capable of using wavelengths of 300 and 600 metres in length as measured by the standard of measurement in use at the Post Office in the United Kingdom for the time being, and may have such other wavelengths as shall be authorised in writing from time to time by the Minister or any authorised officer ;

(f) The speed of transmission and reception of messages shall not, in normal circumstances, be less than 20 words per minute, five letters being counted as one word.

(2) To transmit and receive messages by means of the licensed installation between the said ship station and coast stations and other ship stations : Provided that the transmission and receipt of messages from and at the said ship station when in any harbour in the British Islands shall be subject to such conditions and restrictions as the Postmaster-General of the United Kingdom may prescribe from time to time, and when in any harbour in the Commonwealth or any territory under the control of the Commonwealth, shall be subject to the Regulations under the Wireless Telegraphy Act, 1905-1919 ; and

(3) To receive money or other valuable consideration for or in respect of the use of the

licensed installation, or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions :—

1. In these presents (and in the First Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say) :—

The expression " wireless telegraphy " has the same meaning as in the Wireless Telegraphy Act, 1905-1919.

The term " telegraph " has the same meaning as in the Telegraph Act, 1869, of the United Kingdom.

The expression " naval signalling " means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's navy, between ships of His Majesty's Navy or a naval station, and any other wireless telegraph station, whether a coast station or a ship station.

The expression " His Majesty's Navy " includes ships, being part of the naval forces of any part of His Majesty's Dominions.

The expression " the Admiralty " means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

The expressions " the International Telegraph Convention " and the " International Telegraph Regulations " mean respectively the International Convention of St. Petersburg, dated the 10th to 22nd July, 1875, and the Service Regulations made thereunder, and include respectively any modifications of the Convention or Regulations made from time to time.

The expression " the Radiotelegraphic Convention," 1912, means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder, and includes any modification of the Convention or Regulations made from time to time.

The expression " coast station " means a station which is established on land or on board a ship permanently moored, and which is open for the transmission and receipt of messages by means of wireless telegraphy between land and ship stations or other coast stations.

The term " ship station " means a wireless telegraph station established on board a ship which is not permanently moored.

The expression " authorised officer " means any officer thereto authorised in writing by the Minister.

2. The licensed installation shall not be used by the licensee or by any other person, either on behalf or by permission of the licensee, for the transmission or receipt of messages authorised by this licence.

3. (1) The licensee shall not by the transmission of any message by means of the licensed installation or otherwise by the use of the licensed installation interfere with naval signalling.

(2) Stations using wavelengths longer than those set apart for naval purposes shall not emit any subsidiary waves or harmonics likely to interfere with signalling or the commercial wavelengths or naval wavelengths in the vicinity.

(3) If the Minister is of opinion that the working of the licensed installation specified in

the First Schedule hereto is inconsistent with the free use of naval signalling, the licensee shall, when required in writing by the Minister or any authorised officer so to do, close the said station.

(4) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this Licence, the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the "Wireless Telegraphy Act," 1905-1919, so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraphic Convention, 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister or any authorised officer from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed installation to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed installation shall not, without the consent of the Minister or any authorised officer, be altered or modified in respect of any of the particulars mentioned in the Schedules hereto.

9. The installation shall include such emergency installation as may be required according to the class of the ship station under the provisions of Article XI of the Service Regulations annexed to the Radio Telegraphic Convention, 1912.

10. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

11. (1) Subject to the provisions of this licence, the licensee shall transmit and receive messages by means of the licensed installation on equal terms without favour or preference, whether as regards rates of charge, order of transmission, or otherwise; Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government or the Government of the Commonwealth, the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

12. The licensee shall, so far as possible, receive from ships and light stations all requests for assistance and all signals of distress, and shall answer such requests and signals and re-transmit them with the least possible delay to the proper authorities by means of the licensed installation or any other means in the power of the licensee.

13. The licensed installation at the said ship station shall be worked only by a person or persons holding a certificate or certificates of proficiency issued by the Minister or by the Postmaster-General of the United Kingdom. Certificates of proficiency shall be granted only to persons who satisfy the Minister that they possess the requisite technical proficiency as

regards operating and knowledge of the Regulations governing signalling, and shall be in such form and subject to such conditions as the Minister shall from time to time prescribe.

14. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or the Government of the Commonwealth or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee by means of the licensed installation. The operator and other persons having access to the messages transmitted or received by the licensed installation shall make a declaration of the secrecy of wireless communications.

15. The licensee shall keep full accounts, records, and registers of all messages transmitted by means of the licensed installation, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister or any authorised officer shall from time to time reasonably require to be shown, messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms, written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraphic Convention, 1912, and in default of any provisions on the subject in the said Convention for such period as is from time to time prescribed by the International Telegraph Regulations, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the Head Office of the licensee in between the hours of 10 a.m. and 5 p.m., on every day, except Sunday or a Statute or general holiday.

16. The Minister or any authorised officer may at all reasonable times enter upon the ship station hereby licensed for the purpose of inspecting, and may inspect any installation fixed or being in such station for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such station and the working and use of such installation and telegraphic instruments.

17. The licensee shall cause to be carried on the ship to which the licence relates a print or copy of the licence certified under the hand of an appropriate officer of the Minister to be a true copy, and also such documents as may be prescribed by the Minister for the purpose of enabling the licensee to communicate with coast stations in accordance with the Radiotelegraphic Convention, 1912.

18. (1) The licensee shall pay to the Minister for and in respect of the licence hereby granted a fee of one pound per annum.

(2) The fee payable under this licence shall be payable before the issue of the licence, and the fee payable upon the renewal of the licence shall be payable before such renewal.

19. Except with the consent in writing of the Minister or any authorised officer, the licensee shall not assign, underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licence powers or authorities hereby granted.

20. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed installation, it shall be lawful for any officer in command of any ship

Particulars of Emergency Installation :—
Other particulars :—

SCHEDULE II.

Complete scheme of connections authorised to be employed in the herein licensed station.

This drawing, which is purely diagrammatic, shows the circuits authorised to be employed in both the transmitter and receiver.

Signed, sealed, and delivered by the

Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919.

(L.S.)

Signed, sealed and delivered by the licensee in the presence of

(L.S.)

Form 3.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY ACT 1905-1919.

LAND STATION LICENCE.

E In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by section 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to erect a wireless land station at and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said station shall be carried out in accordance with the provisions of the said Regulations, as amended from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorised in writing by the Postmaster-General.

By direction of the Postmaster-General.
Chief Manager Telegraphs and Wireless.
Date

SCHEDULE OF THE AUTHORISED STATION.

1. No. of licence. Expires
2. Locality of station.
3. Name of owner and of the property on which station is situated.
4. Source of power and maximum power taken by transmitter.
5. Normal range in nautical miles—
(a) by day.
b) by night.
6. System of radiotelegraphy with the characteristics of the system of emission.
7. Type of aerial.
8. Wavelength in metres (the normal wavelength is underlined).
9. Stations with which communication is permitted.
10. Hours of service.
11. Charges for service.

Signature of licensee,

Date

Form 4.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY ACT, 1905-1919.

BROADCAST STATION LICENCE.

F In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Clause 5 of the Wireless Telegraphy Act 1905-1919

and by the Wireless Telegraphy Regulation (name)
(address)

are/is hereby licensed to erect a Broadcasting Station at

and to operate the said station for a period of five years from the date hereof. The installation and operation of the said station shall be carried out in accordance with the provisions of the said Regulations and such amendments and additions thereto as are made from time to time.

Signed, sealed, and delivered by the Minister or member of the Executive Council for the time being administering the Wireless Telegraphy Act, 1905-1919.

This licence is accepted by me under the conditions above set out.

Signed, sealed, and delivered by the said licensee in the presence of

SCHEDULE OF THE AUTHORISED STATION.

1. No. of licence. Expires
2. Name of licensee.
3. Location of station.
4. Type of transmitter. Power watts.
5. Type of receiver.
6. Operating wavelength. Call sign.
7. Circuit diagram of transmitter and receiver.

No.

Form 5

COMMONWEALTH OF AUSTRALIA.

Date licence expires

POSTMASTER-GENERAL'S STATEMENT.

WIRELESS TELEGRAPHY ACT, 1905-1919.

BROADCASTING (RECEIVING) STATION LICENCE.

G In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Clause 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to

to erect a broadcasting (receiving) station at and to operate the said station for a period of twelve months ending

The installation and operation of the said station shall be carried out in accordance with the provisions of the said Regulations, and any such amendments and additions thereto as are made from time to time.

The payment by the licensee is hereby acknowledged of the licence fee of ten shillings and the subscription of to licensee of Broadcasting station known as

The licensee hereby undertakes faithfully to observe all the requirements of the relative Regulations.

The licensee also agrees, in the event of this licence not being renewed, that the licensed installation will not be operated, nor will it be disposed of, except in the manner provided for in the Regulations.

By direction of the Postmaster-General.

for

Broadcasting Station

Licensee.

Date

Signature of licensee.

Date.

Form 6.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY ACT, 1905-1919.

DEALER'S LICENCE.

H In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Clause 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence to (name)

(address)

to deal in wireless apparatus for a period of twelve calendar months from

The sale, hire or disposal of wireless apparatus by the licensee shall be in accordance with the said Regulations, and any such amendments and additions thereto as are made from time to time.

By direction of the Postmaster-General,

Chief Manager Telegraphs and Wireless.

Date

1. No of licence. Expires
 2. Location of dealer's premises
- Signature of licensee
Date

COMMONWEALTH OF AUSTRALIA.

Form.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY ACT, 1905-1919.

EXPERIMENTAL LICENCE (TRANSMITTING AND RECEIVING).

I In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Section 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to

to erect an experimental wireless station at _____, and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said station shall be carried out in accordance with the provisions of the said Regulations, as amended from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorised in writing by the Postmaster-General.

By direction of the Postmaster-General,

Chief Manager, Telegraphs and Wireless.

Date

SCHEDULE

OF THE AUTHORISED STATION.

1. No. of licence. Expires
 2. Name of licensee.
 3. Location of station.
 4. Type of receiver.
 5. Type of transmitter power watts.
 6. Operating wavelength. Call sign.
- Signature of licensee
Date

Form 8.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY, 1905-1919.

EXPERIMENTAL LICENCE (RECEIVING ONLY.)

J In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Section 5 of the Wireless Telegraphy Act, 1905-1919,

and by the Wireless Telegraphy Regulations a licence is granted to

to erect an experimental wireless station at _____ and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said station shall be carried out in accordance with the provisions of the said Regulations, as amended from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorised in writing by the Postmaster-General.

By direction of the Postmaster-General.

Chief Manager Telegraphs and Wireless.

Date

SCHEDULE

OF THE AUTHORISED STATION.

1. No. of licence. Expires
2. Name of Licensee
3. Location of station
4. Type of receiver

Signature of licensee

Date

Form 9.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY ACT, 1905-1919.

PORTABLE STATION LICENCE.

K In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Clause 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to

to erect a wireless portable station in accordance with particulars in the Schedule, and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said station shall be carried out in accordance with the provisions of the said Regulations as amended from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorised in writing by the Postmaster-General.

By direction of the Postmaster-General.

Chief Manager Telegraphs and Wireless.

Date

SCHEDULE OF THE AUTHORISED STATION.

1. No. of licence Expires
2. Area within which transport and operation of set is permitted.
3. Stations with which communication is permitted.
4. Description of the transmitting apparatus licensed.
5. Description of the receiving apparatus licensed.
6. Wavelength
7. Maximum energy permitted to be employed in transmitter.

Signature of licensee.

Date.

Form 10.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY ACT, 1905-1919.

AIRCRAFT STATION LICENCE.

L In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Clause 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to

to erect a wireless Aircraft Station on aircraft described as _____ employed on service, and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said station shall be carried out in accordance with the provisions of the said Regulations, as amended from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorised in writing by the Postmaster-General.

By direction of the Postmaster-General.

Chief Manager Telegraphs and Wireless.
Date.

SCHEDULE OF THE AUTHORISED STATION.

1. No. of licence Expires.
2. Service or locality in which aircraft is employed.
3. Source of power and maximum power taken by transmitter.
4. Normal range in nautical miles—
(a) By day
(b) By night
5. System of radiotelegraphy with the characteristics of the system of emission.
6. Wavelengths in metres (the normal wavelength is underlined).
7. Charge per word for traffic.
8. Stations with which communication is permitted.
9. Nature of services performed.
Signature of licensee.
Date.

(Coat of Arms).

COMMONWEALTH OF AUSTRALIA.

Certificate No. Form 11.

CERTIFICATE OF PROFICIENCY IN RADIOTELEGRAPHY.

GRANTED BY THE POSTMASTER-GENERAL
FIRST CLASS.

M This is to certify that, under the provisions of the International Radiotelegraphic Convention and the Wireless Telegraphy Act, 1905-1919, Mr. _____ has been examined in Radiotelegraphy, and has passed in—

- (a) The adjustment of apparatus and knowledge of its working.
- (b) Transmission and sound-reading at a speed of not less than twenty words a minute.
- (c) Knowledge of the regulations applicable to the exchange of radiotelegraphic traffic.

The candidate is proficient in the following systems:—

It is also certified hereby that the holder has

made a legal declaration that he will preserve the secrecy of correspondence.

Signature of Certifying Officer—

Chief Manager Telegraphs and Wireless.
Secretary, Postmaster-General's Department
Date.

Signature of Holder.

Date of Birth. Place of Birth.

N.B.—This certificate may be indorsed, or withdrawn at the discretion of the Minister, in case of misconduct or breach of the Regulations on the part of the holder. Unless so withdrawn, it will continue to be valid so long as the Regulations of the Radiotelegraphic Convention concluded in London in 1912 remain in force.

Form 12.

COMMONWEALTH OF AUSTRALIA.

CERTIFICATE OF PROFICIENCY AS A WATCHER IN RADIOTELEGRAPHY.

GRANTED BY THE POSTMASTER-GENERAL.

N This is to certify that, under the provisions of the Navigation Act, 1912-1920, Mr. _____ has been examined in Radiotelegraphy, and—

(a) Is capable of receiving and understanding the Radiotelegraph Distress Signal and the Alarm Signal;

(b) Has sufficient knowledge of the apparatus on which he will be required to keep watch to know by means of a buzzer or other simple test that it is in proper condition to receive signals.

It is also certified hereby that the holder has made a declaration that he will preserve the secrecy of correspondence.

Signature of Examining Officer.

The holder of this Certificate is therefore authorised to perform the duties of a Watcher in Radiotelegraphy.

For Secretary, Postmaster-General's Department.
Date.

Signature of Holder

Date of Birth

Place of Birth

Form 13.

COMMONWEALTH OF AUSTRALIA.

STATUTORY DECLARATION REGARDING SECRECY OF WIRELESS COMMUNICATIONS.

O (1) I, _____ of _____ in the State of _____ do solemnly and sincerely declare:—

1. That I will hold strictly secret all wireless telegraphic or telephonic or other communications that may pass through my hands, or come to my knowledge in—

(a) Conducting experiments in wireless telegraphy or telephony, in accordance with Licence No. _____ granted to me; or

(b) The execution of the wireless telegraphic or telephonic duties entrusted to me.

2. That I will not directly or indirectly either divulge to any person (other than a properly authorised official of the Commonwealth of Australia, or a competent legal tribunal), or make any use whatever of any message or

information coming to my knowledge by reason of the licensed installation. If employed as an operator at a station licensed to conduct commercial wireless traffic I will not give any information directly or indirectly respecting such messages or communications except to the persons for whom such messages or communications are intended or to any authorised officials of the Commonwealth of Australia or authorised official of my employer.

3. That I will not transmit or cause to be transmitted by wireless telegraphy or telephony any message received by me for transmission, or deliver or cause to be delivered to any person any messages received by me by wireless telegraphy or telephony, unless the delivery of such message has been approved by the Minister for the time being administering the Wireless Telegraphy Act, 1905-1919, or by an officer duly authorised by him to approve thereof.

And I make this solemn declaration by virtue of the Statutory Declarations Act, 1911, conscientiously believing the statements contained therein to be true in every particular.

(2)
Declared at the day of 192
Before me

(3)
(4)

NOTE.—Any person who wilfully makes a false statement in a statutory declaration is guilty of an indictable offence, and is liable to imprisonment, with or without hard labour, for four years.

N.B.—To be signed before a Justice of the Peace or a Commissioner for Declarations, and returned to the Chief Manager Telegraphs and Wireless, Postmaster-General's Department, Melbourne.

Form 14.

(Front of Card).

Coat of Arms.

COMMONWEALTH OF AUSTRALIA.

CARD OF AUTHORITY TO IN-
STALL AND OPERATE WIRELESS
INSTALLATION ON PORTABLE
AIRCRAFT
STATION.

ISSUED BY ORDER OF THE POSTMASTER-
GENERAL.

(Inside of Card.)

POSTMASTER-GENERAL'S DEPARTMENT.
WIRELESS BRANCH, MELBOURNE.

Date

The bearer, Mr.
address

has been authorised by the Postmaster-General to install and operate wireless telegraph apparatus for receiving and transmitting within a locality described as from to in accordance with the conditions of Licence No. granted to

This card is to be carried on all portable or aircraft stations during the time wireless telegraph apparatus is installed thereon.

Chief Manager Telegraphs and Wireless.

NAVIGATION ACT.

P The Commonwealth Parliament passed in 1912 a Navigation Act which contains a clause making it compulsory for ships trading in Australian waters to be equipped with apparatus for wireless telegraphy. This matter is dealt with in section 231 of the Act, and the text of the section given below is as under:—

EXTRACT FROM NAVIGATION ACT, 1912.

DIVISION VI.

231. (1) Except as prescribed, every foreign-going ship, Australian trade ship, or ship engaged in the coasting trade, carrying fifty or more persons, including passengers and crew, shall before going to sea from any port in Australia be equipped with an efficient apparatus for wireless communication in good working order in charge of one or more persons holding prescribed certificates of skill in the use of such apparatus.

(2) For the purposes of this section apparatus or wireless communication shall not be deemed to be efficient unless:

(a) It is capable of transmitting and receiving messages over a distance of at least 100 miles, day and night.

(b) The person controlling the operator undertakes in writing to the Minister to exchange, and does, in fact, exchange, as far as may be physically practicable (of which the master shall be the judge) messages with shore or ship stations using similar or other systems of wireless communication; and

(c) There is provided, in connection with the apparatus, and ready for use whenever from any cause the ordinary supply of electrical power is not available, a battery of accumulators of such capacity as to insure for a period of at least six hours communication of the efficiency prescribed in paragraph (a) of this sub-section.

(3) The equipment shall, if so prescribed, include a silent chamber for the receipt of messages.

(4) The master of a ship required by this section of the regulations to be equipped with wireless telegraphy apparatus shall not take her to sea, and the owner of a ship required to be so equipped shall not permit her to go to sea, unless the requirements of this section have been complied with.

PENALTY: One Thousand Pounds.

(5) The regulations may prescribe the times and hours during which an operator shall be in attendance on the apparatus, ready to receive or transmit messages.

(6) Except as otherwise prescribed, the provisions of this section shall not apply to ships plying exclusively between ports in Australia less than two hundred miles apart.

(7) The Governor-General may make regulations in accordance with the provisions of any International Convention to which the United Kingdom is a party relating to the use of wireless telegraphy on ships, and such regulations may be in addition to, or in substitution either wholly or in part for the provisions of this section.

STATUTORY RULES.

1924. No. 72.

REGULATIONS UNDER THE NAVIGATION ACT, 1912-1920.

Q I, the Governor-General, in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following

Regulations under the Navigation Act, 1912-1920, to come into operation forthwith. first day of October, 1921.

Dated this eighth day of May, 1924.

FORSTER,
Governor-General.

By His Excellency's Command,

AUSTIN CHAPMAN,

Minister of State for Trade and Customs.

NAVIGATION (WIRELESS TELEGRAPHY) REGULATIONS.

1. These Regulations may be cited as the Navigation (Wireless Telegraphy) Regulations, 1924.

2. In these Regulations, unless the contrary intention appears—

"Automatic Apparatus" means an automatic apparatus approved by the Board of Trade of the United Kingdom;

"On Watch" means on watch in the wireless telegraph room of the ship;

"Signal of Distress" means the wireless distress call as specified in Schedule IV to the Act; and

"The Act" means the Navigation Act, 1912-1920.

3. (1) Subject to the next succeeding sub-regulation, these Regulations shall apply to ships (British and foreign) of the classes enumerated in the next succeeding Regulation which—

(a) Carry more than twelve passengers; or
(b) Are of sixteen hundred tons gross registered tonnage or upwards.

(2) These Regulations shall not apply to—

(a) River and bay ships;

(b) Limited coast-trade ships which do not trade beyond 100 nautical miles from principal port of departure; or

(c) Ships not registered in Australia (other than British ships regularly employed in trading from a port in the Commonwealth) unless they take on board, at a port in the Commonwealth, passengers to be conveyed to another port, within or without the Commonwealth.

4. (1) For the purposes of these Regulations ships shall be classified as follows:—

Class I.—Australian trade and foreign-going ships carrying 200 or more persons.

Class II.—(a) Australian-trade and foreign going ships carrying 50 but less than 200 persons; and

(b) Limited coast-trade ships carrying 50 or more persons; and

Class III.—Ships carrying less than 50 persons

Provided that, notwithstanding anything contained in this regulation, until otherwise prescribed the following ships shall be deemed to be classified in Class III.

(a) Australian-trade and limited coast-trade ships; and

(b) Foreign-going ships, when actually carrying less than two hundred persons, including passengers and crew, and proceeding between ports of call in the Commonwealth.

(2) In computing, for the purposes of this Regulation, the number of persons carried by a ship, there shall be included the normal crew of the ship and the maximum number of passengers provided for in the passenger certificate (if any) of the ship.

(3) Until the first day of October One thousand nine hundred and twenty-two all foreign going ships, when actually carrying less than two hundred persons, including passengers and crew, and proceeding between ports of call in

the Commonwealth, shall, notwithstanding anything contained in this regulation, be deemed to be classified in Class III.

5. Those ships only to which these Regulations apply shall be ships which are required to be provided with a wireless telegraph installation, to maintain a wireless telegraph service and to be provided with certificated operators and watchers in accordance with section 231 of the Act.

6. (1) The wireless telegraph installation with which ships are to be provided in accordance with section 231 of the Act shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention for the Safety of Life at Sea, 1914), or of any international agreement superseding the International Radiotelegraph Convention, 1912.

(2) In the event of an automatic apparatus for registering the signal of distress being approved by the Board of Trade of the United Kingdom, a ship of Class III shall be provided, in addition, with such an apparatus unless the normal duration of the voyage of the ship from one port of call to the next does not exceed eight hours.

7. The installation shall be of the spark or interrupted continuous wave type.

8. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this Regulation as to emergency installations as well as the requirements as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting, by day, under normal conditions and circumstances, clearly perceptible signals from ship to ship over a range of at least 100 nautical miles.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and the independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this Regulation an installation shall be deemed to comply with the requirements of this Regulation as to range if it is able to maintain, over sea, by day, with a Post Office Standard station when employing a receiver without amplification devices, communication on a 600-metre wave at a range of one and a-half times the number of nautical miles respectively prescribed by this Regulation.

9. There shall be provided, between the bridge and the wireless telegraph room, means of communication by voice pipe, telephone or other means approved by the Director of Navigation, and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

10. If not fitted with automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while the ship is at sea a certificated operator shall be always on watch:—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

- (a) Voyage exceeding 48 hours from port to port. Three operators, of whom one shall hold a First Grade Certificate, and not more than one a Third Grade Certificate.
- (b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. Two operators, of whom one shall hold a First or a Second Grade Certificate.
- (c) Voyage not exceeding 8 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while the ship is at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Regulations, and either a certificated operator or a certificated watcher shall always be on watch at other times :—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

- (a) Voyage exceeding 48 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate, and two watchers.
- (b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate, and one watcher.
- (c) Voyage not exceeding 8 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade Certificate, and while the ship is at sea the operator shall always be on watch at the times specified in the Schedule to these Regulations :

Provided that if the duration of the voyage on which the ship is employed does not exceed eight hours from port to port the operator shall be on watch during the whole time of the voyage.

11. If fitted with an automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while the ship is at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Regulations, and a watch shall be maintained in the wireless telegraph room on the ship at all other times either by a certificated operator, or by a watcher, or by means of the automatic apparatus :—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

- (a) Voyage exceeding 48 hours from port to port. Two operators, one of whom shall hold a First Grade Certificate.
- (b) Voyage not exceeding 48 hours from port to port. One operator who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II or III shall carry one operator, who shall hold a First or a Second Grade Certificate, and while the ship is at sea the operator shall be on watch during the times specified in the Schedule to these Regulations, and a watch shall be maintained in the wireless telegraph room on the ship at all other times either by an operator, or by a watcher, or by means of the automatic apparatus :

Provided that if a ship of Class III is fitted with an automatic apparatus for registering

the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, the operator shall not while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Regulations.

12. For the purposes of the last two preceding Regulations, the number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between the port of call and the next.

13. (1) For the purposes of these Regulations:

(a) An operator shall be deemed to hold a First Grade Certificate if he holds a First Class Certificate of Proficiency issued by the Postmaster-General under the Wireless Telegraphy Regulations 1920 (being Statutory Rules, 1920, No. 256) or under any regulations superseding those regulations made under the Wireless Telegraph Act 1905-1919, and has had at least three years' experience as an operator.

(b) An operator shall be deemed to hold a Second Grade Certificate if he holds a First or Second Class Certificate of Proficiency so issued by the Postmaster-General, and has at least one year's experience as an operator :

Provided that, where it is shown to the satisfaction of the Director of Navigation that a sufficiency of operators holding First or Second Class Certificates of Proficiency issued by the Postmaster-General and having at least one year's experience as an operator are not available in the Commonwealth, he may to the extent of the deficiency in number of such operators, by writing under his hand, permit of the employment, as Second Grade Operators, of persons holding First or Second Class Certificates of Proficiency but with less than one year's experience as operators, and such persons so employed shall be deemed to be Second Grade Operators for the purposes of these Regulations :

(c) An operator shall be deemed to hold a Third Grade Certificate if he holds a First or Second Class Certificate of Proficiency so issued by the Postmaster-General, and has had less than one year's experience as an operator ; and

(d) A watcher means a watcher certificated by the Postmaster-General, or by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the Regulations annexed to any International Radiotelegraph Convention for the time being in force.

(2) First, Second or Third Grade Certificates, or equivalent certificates, granted to operators by the Government or any part of His Majesty's Dominions or of a foreign country in pursuance of the Regulations annexed to any International Radiotelegraph Convention for the time being in force, shall be accepted as First, Second or Third Grade Certificates within the meaning of these Regulations.

14. The Navigation (Wireless Telegraphy) Regulations, being Statutory Rules, 1921, No. 104, as amended by Statutory Rules, 1921, Nos. 132, 179 and 217 ; 1922, No. 143, and 1923, No. 96, are hereby repealed.

SCHEDULE.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

See under Great Britain, Merchant Shipping (Wireless Telegraphy) Rules 1920. (Item I).

Provided that, until otherwise prescribed, the time or watch for operators on Australia n

trade and limited coast-trade ships to which these Regulations apply may, in lieu of those set out in the schedule, and at the option of the owner, be in accordance with the provisions of the agreement between the Commonwealth Steamship Owners' Association and others of the one part and the Radio-Telegraphists' (Marine) Institute of Australasia of the other part, dated the 29th March, 1920, certified in the Commonwealth Court of Conciliation and Arbitration on 22nd September, 1902.

R BROADCASTING. SUMMARY OF PROJECTED NEW REGULATIONS.

Details of the new regulations governing wireless broadcasting in Australia were announced by the Prime Minister (Mr. Bruce) in moving the adjournment of the House of Representatives in July, 1924.

The principal provisions of the new regulations are as follows:—

(1) Licences will be issued to class "A" stations, which will obtain revenue from receiving licence fees, and class "B" stations, which will not receive revenue from licence fees.

(2) Advertisements will be permitted on both classes of station, but in each case a tariff of advertisement charges must be published, and no advertisement may be refused excepting with the approval of the Postmaster-General.

(3) On "A" class broadcasting stations advertising shall be confined to periods not exceeding five minutes and aggregating not more than 30 minutes in a regular programme, or 60 minutes in 12 consecutive hours. Advertising will be preceded by a suitable announcement.

(4) Both classes of station will be permitted to relay or broadcast programmes from other stations by agreement with, and with the approval of, the Postmaster-General.

(5) Minimum powers in which the stations shall operate will be specified.

(6) The existing licensee shall be permitted to operate "A" class stations, and in Queensland and Tasmania where no license has yet been issued, one "A" class station will be authorised in each case.

(7) The two existing licensees in New South Wales will receive 70 per cent. and 30 per cent. respectively of the allotted revenue collected within the State, and the same allocation will be made in respect of the two Victorian licensees—the higher percentage being paid to the company operating the higher power station. It is intended that one company in each State shall operate on a power of not less than 5,000 watts, and the other not less than 1,500 watts.

(8) If the apportionments are objected to, a settlement by arbitration will be accepted by the Government.

(9) In other States the allotted revenue

collected within the State will be paid to the licensee authorised in that State.

(10) All licence fees will be collected by the department.

(11) Where a reasonable public demand exists licensees will be expected to establish additional broadcasting (including relay) stations. In case of failure to meet reasonable demands, rights will be reserved to licence other broadcasters and to allot a proportion of the revenue.

(12) Subject to satisfactory service being rendered, the regulations, so far as they relate to the number of class "A" station licensees, and the amount in respect of each class of receiving licence fee apportioned to the broadcasting licensees, shall not be altered within a period of two years from the date of issue. At the end of that period rights are reserved to revise the position and make such alterations as may be deemed necessary.

(13) In default of satisfactory service, reservations are provided to cancel the licence or any portion of the rights secured thereunder.

(14) For the purpose of fixing receiving licence fees, the territory will be divided into three zones, giving roughly a 250-mile radius in the first zone, 150 miles extending beyond the first in the second, and the rest of the territory of the State in the third.

(15) The proposed fees per annum for the three zones are respectively, ordinary licence, 1924-25, 35s., 30s., and 25s.; 1925-26, 30s., 25s. and 20s.; special licence for hotels, entertainments, etc., where profit is to result, £10, £9, £7 10s.

(16) Dealers will be licensed, and will be charged per annum as follows: Zone (1), £5; zone (2), £3; zone (3), £2. There will be no restrictions on the design of equipment or the sale of apparatus by registered dealers.

(17) Experimental licences will be issued in cases where the department is satisfied that the applicant possesses sufficient knowledge to undertake scientific research and investigations. The charges per annum will be: Zone (1) 20s.; zone (2), 17s. 6d.; zone (3), 15s. There will be no stipulation prohibiting the reception of broadcasting programme or the design of receiving equipment.

(18) The revenue to be collected will be apportioned between the department and the broadcasting licensees. From the ordinary licensees the Post Office will retain 5s., and the balance will go to the broadcasting companies. The latter amount is variable, depending upon the zone.

(2) Penalties are provided for breaches of the regulations.

In regard to penalties Mr. Bruce said that it was obvious that with open sets anybody could pick up the programme, whether they paid or not. Therefore it would be necessary to "police" the regulations.

AUSTRIA

(See Maps 2 and 8).

CONTROL AND ORGANISATION.

WIRELESS telegraphy in the Republic of Austria is under the control of the Federal Ministry of Commerce and Communications, Direction General of Posts and Telegraphs, Vienna.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Konrad Hoheisel	Postmaster-General	Postgasse 8, Vienna I.
Januar Jokisch	Chief of Telegraph and Telephone Section	Postgasse 8, Vienna I.

Radiotelegraphic service with foreign countries is carried on by the Radio-Austria Aktiengesellschaft under a concession from the Federal Government, dated September 18th, 1922. This Company operates the high power transmitting station at Deutsch-Altenburg, and the receiving station on the Laaerberg; the Central Traffic Office being at 14 Renngasse, Vienna. Regular communication is maintained with England, Germany, Bulgaria, Roumania, Poland, Russia and Fiume, and weather reports are also broadcast twice daily.

The internal and broadcasting services in Austria have also been granted by a concession dated February 19th, 1924, to a private enterprise whose transmitting station is at Stubening 1, Vienna.

There are now seven wireless societies.

We print below the text of the Federal Government Bill of July 18th, 1924, which has been approved by the National Council, and contains the provisions governing wireless telegraphy. The Decrees provided for by this law have not yet been issued, and, pending their publication, the Decree of the Ministry of Commerce, dated January 7th, 1910, remains in force.

Licences for private commercial or experimental stations remain in abeyance pending the working agreement with the private enterprises mentioned above for internal and broadcasting services. Regulations concerning Aviation Service, Time Signals, etc., have not yet been issued.

A—Extracts from Law of July 18th, 1924.

B—Decree of January 7th, 1910 (at present in force pending issue of Regulations under the above law).

EXTRACTS FROM THE FEDERAL LAW OF JULY 18TH, 1924.

RESPECTING TELEGRAPHS (TELEGRAPH LAW).

A Those clauses which relate only to
Wired Telegraphy and Telephony are
omitted.

I.

GENERAL PROVISIONS.

§ 1. Definition of the term "Telegraph."

§ 2. Classification of telegraphs.

§ 3. Telegraph Taxes.

II.

RIGHTS RESERVED TO THE FEDERAL STATE.

§ 4. Construction and working of public telegraphs.

§ 5. Construction and working of private wireless telegraphs

(1) The construction and working of transmitting and receiving apparatus for private wireless telegraphs is an exclusive right of the Federal State. This also holds good particularly as regards transmitting and receiving apparatus on ships and aircraft of Federal Austrian nationality, and for ships and aircraft of foreign nationality which are in Federal territory.

(2) By special licence the Federal right indicated in paragraph 1 can also be exercised by other persons. In the licence deed shall be indicated the conditions, on the fulfilment of

which the granting of the right for the construction and working of transmitting and receiving stations for private wireless telegraphy is made dependent.

(3) The special permission of the Federal State for the construction and working of wireless telegraphs only extends to wireless telegraphs for the purposes of working a branch of traffic which is under the special supervision of the Federal State and for the weather service if this is expressly laid down in the licence deed.

(4) Conditions deviating from the provisions of paragraphs 1 and 2 may be made on the basis of international treaties.

§ 6. Devices for Wireless Telegraphy.

(1) To manufacture, to import into the Federal Territory, to distribute and to possess wireless telegraphic apparatus or its component parts is, irrespective of the conditions to be fulfilled in accordance with other laws, only admissible with the approval and under supervision of the Federal State.

(2) More detailed provisions will be fixed by decree; similarly the objects will be designated which are to be considered as essential component parts of devices for wireless telegraphs.

§ 7. Manufacture and Working of Private Telegraphs with metal connection line.

§ 8. Supervision of the Federal State.

(1)

(2)

(3) Telegraphs erected or worked without authorisation may be put out of action without previous warning. The apparatus belonging to such installations or the apparatus and component parts of wireless telegraphs which form the subject of a prohibition in accordance with § 6 may be confiscated.

§ 9. *Stoppage of Telegraphs.*

III.

TELEGRAPH ADMINISTRATION.

§ 10. *Sphere of activity of the Federal Telegraph Authorities.*

(1) The Federal State exercises the rights conferred upon it by this law in general through the medium of the Federal Telegraph Authorities.

(2) The sphere of activity of the Federal Telegraph Authorities includes particularly:—

- (a)
- (b)
- (c)
- (d)

(e) The regulation of the service and working of all wireless telegraphs and public telegraphs. The regulation of the service and working of telegraphs of the railway, navigation and aerial services is nevertheless only to extend to the service of any general news traffic and, in so far as it is a question of wireless telegraphy relating to the three branches of traffic mentioned, to the actual creation at the time of the conditions requisite for the undisturbed working of wireless telegraphs authorised in the Federal Territory; in both cases such regulation must be effected in agreement with the railway, navigation and aerial authorities.

- (f)
- (g)
- (h)
- (i)
- (j)

§ 11. *Telegraph Authorities.*

§ 12. *Procedure before the Telegraph Authorities.*

§ 13. *Execution.*

§ 14. *Relations of the Telegraph Authorities to other Authorities.*

IV.

PUBLIC TELEGRAPH ESTABLISHMENTS.

§ 15. *Definition of Public Telegraph Establishments.*

§ 16. *Use of Public Telegraph Establishments.*

- (1)
- (2)
- (3)

(4) The public telegraph establishment which exercises the broadcasting service has to form an advisory council, to which also every Federal Province delegates a representative. In particular the drafts of decrees which are to be issued for the regulation of broadcasting are to be transmitted to the Council in order that they may define the position. For the rest, the manner of the composition of the advisory council and its sphere of activity is more closely prescribed by a decree which needs the consent of the Chief Committee of the National Council.

§ 17. *Secrecy of Telegraphic Correspondence.*

- (1)
- (2)

(3) The obligation to maintain the secrecy of telegraphic correspondence does not exist:—

- (a)
- (b)
- (c) As regards the broadcasting authorities.

(d) As regards broadcasting which is of an entertainment character.

- (4)
- (5)
- (6)
- (7)

§ 18. *Inadmissible Communications.*

§ 19. *Competence of the Telegraph Authorities to decide disputes arising from the use of public telegraph establishments.*

§ 20. *The making of Claims of Compensation against the Public Telegraph Establishments.*

§ 21. *Possibility of Carrying out Decisions.*

V.

LEGAL EXECUTIVE PROVISIONS.

§ 22. *Limitations in Execution.*

VI.

PENAL PROVISIONS.

§ 23. *Alteration of the Penal Law of May 27th, 1852, R.G.B.I., No. 117.*

§ 24. *Misuse of Public Telegraphs.*

§ 25. *Violation of Telegraphic Secrecy.*

(1) If any employee or official of a telegraph authority or a public telegraph establishment intentionally:—

1. Without authorisation makes to an unauthorised person a communication regarding the fact or the contents of the telegraph traffic of specific persons, or turns to his own account facts to which the duty of telegraphic secrecy extends (§ 17).

2. Without authorisation opens a telegram entrusted to a public telegraph establishment or investigates its contents.

3. Suppresses, falsifies or tampers with a telegram or without authorisation withholds it from the person entitled to receive it.

4. Suppresses or illicitly intercepts a telephone conversation or a broadcasting message.

5. Allows or facilitates to an unauthorised person one of the actions indicated in paragraphs 2 to 4, he will in so far as the fact of a severely punishable action is not in question be punished by the Court for misdemeanour with close arrest not exceeding six months, and further with a fine not exceeding six million kronen.

6. The persons indicated in paragraph 1, who intentionally, by virtue of their knowledge as employees or officials of a telegraph authority or a public telegraph establishment, after their retirement or the termination of their condition of service and powers of procuration, without authorisation make an unauthorised person a communication regarding the fact or the contents of the telegraphic traffic of specific persons, are subject to the same penalty.

§ 26. *Infringement of the Rights Reserved to the Federal Government.*

(1) 1.

2. Anyone who without authorisation manufactures, imports into the Federal Territory, distributes, or possesses apparatus for wireless telegraphs or its essential component parts (§ 6).

3.

4. Anyone who without authorisation picks up, on a wireless receiving station licensed by the Federal Government, a message proceeding from or directed to a public telegraph station and utilises the message picked up.

5.
Becomes guilty of a misdemeanour and is

punished (irrespective of the application of severer penal provisions) with a fine not exceeding six million kronen or with imprisonment not exceeding one month; in aggravating circumstances both punishments are to be inflicted.

(2) Anyone who incites another to the action or abets him therein is subject to the same punishment as the culprit.

(3) An attempt is punishable.

§ 27. *Penal Provisions of the Telegraph Decrees.*

§ 28. *Procedure in the Cases of Misdemeanour indicated in §§ 26 and 27.*

§ 29. *Destination of Fines.*

VII.

EVASION OF TELEGRAPH TAXES.

§ 30. *Computation of Evaded Taxes.*

If it is established by the legal decision of a telegraph authority or of a court of law that anyone has deprived a public telegraph establishment or the Federal Government of taxes through the illegal erection or the illegal working or the illegal utilisation of a telegraph, then the Federal Telegraph Authority may, irrespective of the punishment inflicted on account of the illegal action, order the guilty party to pay the evaded taxes, in the case of wireless telegraphs to the extent of one hundred fold, in the case of ordinary telegraphs to the extent of tenfold of the evaded taxes, according to the laws in force at the period of the verification of the illegal action.

VIII.

FINAL AND TRANSITIONAL PROVISIONS.

§ 31. (1) *This law comes into force on October 1st, 1924.*

(2) The Cabinet Rescript of January 16th, 1847, and the Court Chancellery Decree of January 25th, 1847, Z. 2581, pol. Ges. S. Nr. 9, Clause 2 of the Law of December 29th, 1892, R.G.Br. Nr. 234, and Clause 3 of the Law of May 28th, 1895, R.G.Br. Nr. 76, at the same moment cease to be applicable.

§ 32. *The Federal Law of June 7th, 1922, B.G.Br. Nr. 348 (Law of Electrical Communication) is altered as follows:—*

(a) § 1, paragraph 3, should read: "By the term 'Telegraph Installations' in this law is understood equipment and installations of all kinds used for the transmission of signals, pictures, writing or sound by means of electricity."

(b)
(c)
(d)

§ 33. *Legal Position of the Concessions Granted.*

(1) The legal position of the concessions granted for the carrying on of a public telegraph station is not abrogated by this law. The general foreign broadcasting service may only be carried on by the public telegraph establishment which exercises the general interior broadcasting service.

(2)

§ 34. (1) If any one without the permission necessary in accordance with this law before the day of its coming into force erects a wireless telegraphic transmitting or receiving station, or has taken possession of an object, the possession of which, according to § 6 is only admissible with the consent of the Federal Government, he must within six weeks from the coming into force of this law notify the Federal Telegraph Authority of it, and if he wishes to continue to work the apparatus or to keep the

object in his possession, he must apply for the requisite authorisation to do so.

(2) Any person making the notification in time shall be only punished for unauthorised possession of the objects indicated (§ 26, paragraph 1, line 2) if after making the notification he takes steps in connection with these objects which are contrary to § 6 or to a regulation issued based on § 6.

(3) The due making of the notification further excludes punishment for the working of the transmitting or receiving set (§ 26, paragraph 1, line 1), which has previously taken place, and, in so far as the application for licence for working the set is united with the notification, also for the working of the set, which has taken place before the decision as to this application.

(4) So far as in accordance with paragraphs 2 and 3 punishment cannot be inflicted, the forfeiture of the objects indicated cannot, of course, be recognised.

§ 35.

DECREE, JANUARY 7th, 1910.

B The following Decree of the Ministry of Commerce, dated January 7th, 1910, is concerned with wireless telegraph stations in the Austrian Empire, on board Austrian ships, and on ships of foreign nationality in Austrian territorial waters:—

(1) In accordance with a High Decree of Parliament of January 16th, 1847, and the Decree of the Ministry of Commerce, dated April 28th, 1905, the erection and working of Wireless Telegraph stations in the Austrian Empire and on Austrian ships is a State concession to acquire which a written application (liable to Stamp Duty) containing a description of the station and a diagram of connections, must be submitted.

(2) The choice of system, apparatus, and fixtures, as well as the establishment of coast and land rates within the limits of the Wireless Telegraph Agreement of 1909, and the supplemental regulations are the prerogative of the Ministry of Commerce.

(3) The general regulations for Wireless Telegraph stations on board ships are shown below.

(4) Wireless Telegraph stations on board ships must fulfil the following conditions:—

(a) They must be of equal technical efficiency to systems other than that adopted in the stations, and they must be able to inter-communicate with other systems.

(b) The system adopted must be one of "syntonisation."

(c) The speed of transmission and reception must not, under normal circumstances, be less than twelve words (each of five letters) per minute.

(d) The power possessed by the apparatus must not exceed, in normal conditions, 1 kilowatt. A greater power can be used when the ship is under an obligation to exchange messages at a longer distance than 300 kilometres from the nearest coast station, or when the transmission can only be effected by means of a higher power than specified.

(5) The working of Wireless Telegraph stations on board foreign ships in Austrian territorial waters is dependent upon the previous grant of a State concession. This regulation does not apply to warships or ships in distress. If a foreign vessel employs its Wireless Telegraph station without authorisation, the State authorities may take steps to prevent the working of the station in Austrian territorial waters.

BASUTOLAND

(See Maps 25 and 32.)

BASUTOLAND is governed by a resident Commissioner under the direction of the High Commissioner for South Africa and located at Maseru, its principal town. The latter high official possesses legislative authority which is exercised by proclamation.

ADMINISTRATION.

In 1904 a proclamation was issued, which we print below, making provision for the working of wireless telegraphy within the territory, but at present there are no wireless stations.

A—Proclamation making provision for Wireless Telegraphy.

A PROCLAMATION.

No. 5 of 1904.

By His Excellency the High Commissioner for South Africa.

Whereas it is expedient to make provision for the working of wireless telegraphy within the territory of Basutoland;

Now therefore by virtue of the powers in me vested I do hereby proclaim, declare and make known as follows:

1. No person shall establish or use any apparatus or installation for the transmission of messages or other communications by means of electrical energy without the aid of wires without having previously obtained a licence as hereinafter provided.

2. (1) It shall be lawful for the Resident Commissioner to authorise the issue of a licence for either of the purposes mentioned in section 1 and to revoke the same at any time, and there shall be payable in respect of such licence the sum of one hundred pounds.

(2) Every such licence shall be deemed to be granted upon such terms and conditions as

the High Commissioner may from time to time prescribe by notice in the *Gazette*.

3. Any person who shall establish or use or attempt to establish or use any such apparatus or installation as is mentioned in section 1 in contravention of the provisions of this Proclamation shall be liable upon conviction to a penalty not exceeding two hundred and fifty pounds and in default of payment to imprisonment with or without hard labour for a period not exceeding three months and in case of a second or subsequent conviction to a penalty not exceeding five hundred pounds or in default of payment to imprisonment with or without hard labour for a period not exceeding six months.

4. This proclamation shall take effect from the date of its publication in the *Gazette*.

Given under my hand and seal at Johannesburg this twenty-fourth day of February, One thousand nine hundred and four.

MILNER,
High Commissioner.

BECHUANALAND PROTECTORATE

(See maps 25 and 32).

UNDER the High Commissioner for South Africa, who is the Legislative Authority, this territory is administered by his representative, the Resident Commissioner, whose headquarters are at Mafeking, in the Cape Province.

In view of the geographical position of that part of the territory of South West Africa, east of longitude 21 deg. East, known as Caprivi Zipfel, the Zipfel is now administered as if it were a portion of the Bechuanaland Protectorate.

ADMINISTRATION.

With the exception of the passing of legislation making provision for the working of wireless telegraphy within the Protectorate (Proclamation No. 6 of 1904), nothing has taken place in connection with wireless telegraphy and telephony.

The Resident Commissioner is the authority empowered to issue licences for establishing or using any apparatus or installation for the transmission of messages or other communications by means of electrical energy without the aid of wires, on such terms and conditions as the High Commissioner may prescribe.

We print below the Proclamation by the High Commissioner.

PROCLAMATION No. 6 OF 1904.

Dated 24th February, 1904.

Whereas it is expedient to make provision for the working of Wireless Telegraphy within the Bechuanaland Protectorate.

Now, therefore, by virtue of the powers in me vested, I do hereby proclaim, declare and make known as follows :

1. No person shall establish or use any apparatus or installation for the transmission of messages or other communications by means of electrical energy without the aid of wires without having previously obtained a licence as hereinafter provided.

2. (1) It shall be lawful for the Resident Commissioner to authorise the issue of a licence for either of the purposes mentioned in section one and to revoke the same at any time, and

there shall be payable in respect of such licence the sum of one hundred pounds.

(2) Every such licence shall be deemed to be granted upon such terms and conditions as the High Commissioner may from time to time prescribe by notice in the *Gazette*.

3. Any person who shall establish or use or attempt to establish or use any such apparatus or installation as is mentioned in section one in contravention of the provisions of this Proclamation shall be liable upon conviction to a penalty not exceeding two hundred and fifty pounds, and in default of payment to imprisonment with or without hard labour for a period not exceeding three months, and in case of a second or subsequent conviction to a penalty not exceeding five hundred pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding six months.

4. This Proclamation shall take effect from the date of its publication in the *Gazette*.

BELGIAN CONGO

(See MAPS 25, 26, 28 and 29.)

THE governing body of the colony consists of 14 members, the King being represented by a Governor-General assisted by several provincial governors.

CONTROL.

The Wireless Telegraph Service is controlled by the Ministry for the Colonies, and has a general directorate at Brussels and a local directorate at Stanleyville.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Lt.-Col. Albert Wibier	Director-General	At Brussels.
Mr. Louis Van Cleynenbreugel	Secretary	Do.
Mr. Paul Duchateau	Engineer	Do.
Mr. Raymond Braillard	Consulting Engineer	Do.
Mr. Fernand Bourguet	Director	Do.
Mr. Auguste Mathieu	Chief of Section	At Stanleyville.
Mr. Guido Vinay	"	Do.
Mr. Hubert Melchior	Controller "	Do.
Mr. François Van Calck	"	Do.
Mr. André Vanderveken	"	Do.

There are now 17 stations in operation in the Belgian Congo.

There are no stations used for aviation purposes.

All stations pick up the press telegrams from Europe.

STATIONS COMPLETED OR UNDER CONSTRUCTION.

The network with Boma at the head is divided into the following sections :—

Bas-Congo-Kasai Section.—Boma (Kanga), 750 kW. arc under construction ; Banana O.N.A., Kinshasa and Lusambo, 5 kW. spark. Ilebo 20 kW. arc under construction.

Equator Section.—Coquilhatville, 7 kW. arc ; Basankusu, Umangi, Basoko and Buta, 5 kW. spark.

Stanleyville Section.—Stanleyville (Sololo), 70 kW. arc under construction (to communicate direct with Elizabethville, Boma and Bunia-Kilo) ; Stanleyville and Bunia-Kilo, 5 kW spark.

Lualaba Section.—Kindu, Kongolo, Lukuga and Kikondja, 5 kW. spark. There is a 5 kW. spark station at Elizabethville (Kafubu), where a

70 kW. arc is under construction to communicate direct with Boma (Kanga) and Stanleyville.

The 1½ kW. stations at Kigoma and Usumbura, on Lake Tanganyika, are to be converted and enlarged.

There are radiotelephonic stations at Tshikapa, Charlesville and Dundu.

ADMINISTRATION.

The rules under which radiotelegraphy is administered in the colony are those in force for the Wired Telegraphic Service.

A bill is in preparation for regulating the erection of transmitting stations and granting licences for the reception of radiotelegraphy and telephony.

BELGIUM

(See Maps 2 and 11)

CONTROL.

WIRELESS telegraphy in Belgium is under the control of (a) the Ministry of National Defence with regard to the Army and Military and Civil Aviation, (b) the Telegraph and Telephone Administration, which forms one of the departments of the Ministry of Railways, Marine, Posts and Telegraphs, with regard to public service.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. X. Neujean ..	Minister of Railways, Marine, Posts and Telegraphs ..	Brussels
Mr. A. Roosen ..	Director-General of Telegraphs and Telephones	Do.
Mr. Pierrard ..	Director-General of Marine	Do.
Mr. d'Ardenne ..	Chief Engineer, Director of Telegraph Administration ..	Do.
Mr. A. Deldime ..	Director of Telegraph Administration	Do.
Mr. M. Henrion ..	Chief Engineer, Director of Service, Chief of Technical Office, Telegraph Department	Do.
Mr. Robert ..	Chief Engineer, Director of the Service of Special Apparatus, Radiotelegraphy and Radiotelephony	Do.
Mr. Sadzot ..	Principal Engineer, Technical Office, Telegraph Department	Do.
Mr. R. Corteil ..	Principal Engineer, Wireless Section	Do.
Mr. C. Caenepenne ..	Engineer, Wireless Section	Do.
Mr. Van Heemstée ..	Assistant Engineer, Wireless Section	Do.

ADMINISTRATION.

The administration of Wireless Telegraphy in Belgium is regulated by a Law and Royal Decrees, which are reprinted below:—

- A**—Law of July 10th, 1908, regulating the use of wireless telegraphy and telephony.
- B**—Royal Decree of October 19th, 1908, regulating the application of charges on wireless messages.
- C**—Royal Decree of November 3rd, 1913, regulating the conditions of installation and the working of wireless stations.
- D**—Decree of August 7th, 1920, regarding Amateur Wireless installations.
- E**—Regulations, issued 30th August 1924, regarding Wireless on board Belgian vessels.

A I. LAW OF JULY 10TH, 1908, RELATING TO TELEGRAPHY AND TELEPHONY BY ETHER TRANSMISSION.

ART. 1.—The Government is authorised to undertake the establishment and transmission of wireless telegraphy and telephony by ether waves.

ART. 2.—On Belgian territory or on board of a Belgian steamer or vessel no one is allowed without authorisation previously obtained from the Government to erect, establish or cause to be erected or work apparatus for radio transmission capable of carrying out or prejudicing communications.

Each infraction of the clauses of the pro-

visions of the present Article involves liability to a fine varying from 200 to 2,000 francs, together with imprisonment varying from eight days to a year, or either of these penalties alternatively. Such infringement will carry the additional penalty of confiscation for the benefit of the State of the apparatus and all other objects specially designed for their working. Moreover, the Law Officers shall be able to order suspension in the carrying out of the confiscation of all apparatus and other objects or of a part thereof by placing them in temporary sequestration for a term which may be fixed by the tribunal. This sequestration shall be raised if the interested party or his legal representative shall obtain authorisation to make use of the apparatus. In default of such authorisations, the confiscation of his effects shall take place immediately on the expiry of the term fixed under the judgment, unless the competent Minister shall authorise the delinquent either to destroy the apparatus or to transfer its possession to a duly authorised concessionaire.

The preceding arrangements shall apply even in case of acquittal of the accused, when it has been established that the apparatus and other objects giving rise to the prosecution come under the category covered by the two first paragraphs of the present Article.

ART. 3.—The Government shall fix the rates, as well as the rules of administration and order relative to radiotelegraphy and telephony. Infringement shall be punished in accordance with the penalties established by the law of March 6th, 1908.

ART. 4.—The authorisations referred to in Art. 2 are granted by the Minister exercising jurisdiction over the telegraphic and telephonic services in agreement with the other ministers affected. They shall specifically enumerate their duration, the conditions of installation, use of apparatus, charges where such are made, royalties payable to the public treasury, penalties for infringement and all other limiting conditions, dictated by the interests of public order, as well as by the security and defence of the realm. In the event of infringement of the conditions of authorisation, the latter may be withdrawn by the Minister who granted it. Nevertheless, no royalty can be claimed when it has been proved to the satisfaction of the Minister in Charge of the granting of authorisations that the applicant has no other object than that of experimenting with or making use of the apparatus for his private purpose without making any charge whatsoever.

ART. 5.—No one can establish or work on board a foreign ship or vessel apparatus or radio transmission which can carry out or prejudice radiotelegraphic or radiotelephonic communication, so long as the ship, or vessel, is located in Belgian Territorial Waters, if its action be not in accord with the prescribed regulations set out in Art. 3. The competent Minister may at any time forbid the use of apparatus, or lay down with regard thereto such measures of precaution, supervision and control as he judges necessary.

All infringements of the regulations of the present Article are liable to a fine of 100 to 500 francs. The Law Officers may order the sequestration of apparatus, and of all other objects specifically adapted to their working, for the duration of the stay of the aforesaid vessel in Belgian waters. Such sequestration may be annulled if the interested party obtain from the competent Minister an

authorisation to make use of the apparatus in question.

If, after the annulment of the sequestration, the interested party commits a fresh infraction of the conditions laid down, the fine may be doubled and the apparatus and other objects confiscated for the benefit of the State.

ART. 6.—If for any cause, either by reason of public order or the security and defence of the realm, the Government shall judge necessary to suspend the whole, or part of the service, the concessionaire shall be obliged to obey the first instructions given him to that end.

In the same circumstances the competent Minister may either order the apparatus to be put out of action or sequestered, or he may put the apparatus in the hands of his own agents instead of those of the concessionaires. These measures shall be taken for the duration of the period judged necessary by the Government and shall give rise to no claim for indemnification at the hands of the State.

ART. 7.—The penal laws relative to wireless telegraphy and telephony are applicable to Governmental radiotelegraphy and telephony, as well as to such installations and services as have been duly authorised for public communication.

ART. 8.—The Government may designate the functionaries who shall be sworn in as officers of judiciary police for the investigation of the infringement relative to wireless telegraphy and telephony. The official reports drawn up by these functionaries shall be considered correct until they are proved otherwise.

The above-mentioned functionaries shall take precedence, so far as infringements relative to wireless telegraphy and telephony are concerned over all other officers of judiciary police, with the exception of the Public Prosecutor and the Police Magistrate.

ART. 9.—When there are found to be sufficient traces of the existence of wireless telegraph or telephone installations not regularly authorised or employed, the police magistrates shall visit the localities in which the aforesaid installations shall be presumed to exist, in order to make all necessary investigations into the truth of the allegations, even although it may be necessary to secure access to private property for that purpose.

He may take with himself one or more experts or functionaries sworn in in accordance with the terms of the preceding Article.

He may either effect himself or cause to be effected, by any and all of the officers of the judiciary police, seizure or dismantlement or temporary sequestration of the apparatus set up or employed without regular authorisation, as well as that of all other objects subject to confiscation in accordance with the terms of Arts. 2 and 5 heretofore set out.

ART. 10.—The State undertakes no responsibility for the service of communication by radiotelegraphic or radiotelephonic means.

ART. 11.—The present law shall come into operation the day after its publication.

B 2.—ROYAL DECREE OF THE 19TH OCTOBER, 1908, RELATING TO CHARGES FOR RADIO-TELEGRAMS.

Royal Decree authorising the Minister of Railways, Posts and Telegraphs to settle the amount of charges fixed when necessary in the authorisation for delivery by application of Articles II and IV of the Law of the 10th July, 1908, relating to wireless telegraphy and telephony by ether transmission.

In view of the Law of the 10th July, 1908, relating to wireless telegraphy and telephony;

In view of the International Radiotelegraphic Convention concluded at Berlin in 1906 and the further Acts which complete it;

and

Inasmuch as it is desirable to simplify—so far as charges are concerned—the formalities which appertain to the delivery of Acts authorising the establishment and working of ether transmission, at the suggestion of our Minister of Railways WE HEREBY AGREE:

Sole Article.—Within the limits fixed by the International Convention relating to Radiotelegraphy and Telephony, our Minister of Railways, Posts and Telegraphs is hereby authorised to settle the amount of charges, when such arise, in the authorisations which he is empowered to issue under the authority of Articles II and III of the Law of the 10th July, 1908.

Given at Laeken, the 29th October, 1908.

(Sgd.) LEOPOLD.

C 3.—ROYAL DECREE OF THE 3RD NOVEMBER, 1913, RELATING TO THE CONDITIONS UNDER WHICH WIRELESS TELEGRAPHY SHALL BE INSTALLED AND WORKED.

In view of Art. III of the Law of 10th July, 1908, which authorises the Government to settle the rules of administration and police relative to radiotelegraphy and telephony:

In view of the Law of 16th March, 1908, relating to the penalties incurred by contravention of general measures of interior administration, as well as to the penalties which may be inflicted under the rules laid down by provincial and communal authorities;

and

In view of the proposal of our Minister of Marine, Posts and Telegraphs, WE HAVE SETTLED AND HEREBY DECREE:

ART. 1.—On Belgian territory and on board ships or vessels of Belgian nationality, every and each proposal for the installation of apparatus for ether transmission, capable of assisting or prejudicing the transmission or reception of radiotelegraphic or radiotelephonic signals, as well as all proposals for modification in their employment, and also every and each proposal for the erection or modification of an installation which has already been duly authorised, ought to be submitted to the Department of Marine, Posts and Telegraphs as a preliminary to their starting operations.

Any request for authorisation must indicate the character of the installation, the object of its use, so far as concerns wireless stations on board ship, tariff of charges proposed, detailed list of the apparatus and of the methods of working, wavelengths, hours of watch, and generally all information of a character such as will facilitate detailed examination of the scheme. There shall be moreover thereon set forth the steps it is proposed to take to prevent interference with the service of other official or authorised stations.

ART. 2.—Such authorisations are issued subject to the reservations and conditions which may be judged necessary in the interests of the convenience and defence of the realm, including the safeguarding of public and service messages.

ART. 3.—A new authorisation becomes necessary:

1. If the station has not been installed or modified and put in working order within the period fixed by the Decree of Authorisation.

2. If it has been put in working order or made use of under the conditions other than those set out in the Decree of Authorisation.

ART. 4.—Installations not regularly authorised which shall have been set up previous to the coming into force of the present Decree shall not be privileged thereby: their service must be suspended and a request for authorisation applied for under the conditions and forms set out under Article I of the present Decree.

ART. 5.—On entering into Belgian territorial waters foreign ships fitted with wireless installations capable of assisting or prejudicing transmission or reception of radiotelegraphic or radiotelephonic signals shall cease communication with any neighbouring stations other than the nearest State stations. They shall announce their presence to these coastal stations and await authorisation or invitation to communicate either with the aforesaid or some other coastal station.

The preceding arrangements shall not apply to foreign ships and vessels, provided that previous to their entering within Belgian territorial waters they shall have been provided under order of the competent Belgian Minister with his special and regularly accredited permit for communication. They shall not interfere in any way with distress signals or the answers to distress signals emanating from other ships or vessels.

To sum up: Foreign ships and vessels are enjoined from the time of their entering into Belgian territorial waters to cease all working which may prejudice the communications of any radiotelegraphic or radiotelephonic stations whatsoever.

ART. 6.—On Belgian territory and within Belgian territorial waters as well as on board Belgian ships and vessels located in foreign waters, duly appointed delegates of the Government shall have free access at all hours of day and night, in accordance with Article VIII of the Law of 10th July, 1908, to all ships, vessels and steamers on which regularly authorised installations may be working, or for which a communicating permit has been granted. The owners, managers, charterers, commanders, agents, masters, and personnel are enjoined to facilitate by every possible means the duties of verification and control vested in these delegates.

ART. 7.—The owners, managers and charterers are civilly responsible for the payment of fines decreed against their commanders, directors, agents, masters, or personnel. Our Minister of Marine, Posts and Telegraphs is charged with the execution of the present Decree.

ART. 8.—The present Decree shall come into force the day after its publication dated Brussels, 3rd November, 1913.

MINISTERIAL DECREE REGARDING AMATEUR WIRELESS INSTALLATIONS.

THE MINISTER OF RAILWAY, MARINE, POSTS AND TELEGRAPHS.

DECREES:

D The conditions regulating the establishment and the working of receiving wireless stations are fixed in accordance with the following:—

ART. 1.—Requests for authorisation must be addressed to the Director-General of Telegraphs and Telephones at Brussels.

The person making the request must indicate the precise place and functions of the proposed station and must furnish for approval a description of the apparatus.

The applicant must prove if such should be the case that he is of Belgian nationality.

ART. 2.—Authorisation is granted:—

(a) By the Director-General of Telegraphs and Telephones when the applicant be of Belgian nationality.

(b) By the Minister of Railways, Marine, Posts and Telegraphs to whom the request should be transmitted by the Director-General with his advice, if the applicant be of foreign subject.

ART. 3.—The station authorised will be utilised exclusively for reception of time and weather signals; the transmission of any other electric signal is formally prohibited.

The use of amplifying valves is not allowed. However, the Administration of Telegraphs and Telephones may, in certain particular cases, which must be submitted for approval and after enquiry and examination of the reasons given by the applicant, grant an authorisation to use such apparatus under conditions to be determined by the Administration.

ART. 4.—Under the penalty of immediate withdrawal of the authorisation, the applicant must scrupulously observe, and cause others to so observe, the secrecy of any information which is not intended for public use.

The contents of radiotelegrams other than meteorological telegrams which will eventually be received by the Postal Authorities, must be neither written nor divulged to anyone outside the officials appointed by the Administration of Telegraphs and Telephones, or of the judicial authority. The withdrawal of the authorisation as a result of a contravention of this Law, will be eventually carried out without prejudice to the applicant of any punishment provided for by Law.

ART. 5.—The applicant is forbidden to receive any payment or remuneration whatsoever for the reception of information by means of the station authorised.

ART. 6.—The Government reserves to itself the right to examine installations authorised. When necessary the applicant will grant to the duly commissioned delegates of the Government free access to the said installations, and will facilitate by every means in his power such examination by the delegates.

ART. 7.—The applicant alone is responsible for all consequences whatsoever, resulting from the present authorisation, not only from the point of view of mistakes which may be made, but also in regard to all matters connected with patent rights or of any other rights of a third party. The responsibility of the State is, and will remain, entirely separate in connection with the present authorisation.

ART. 8.—The applicant is held responsible for notifying the Director-General of Telegraphs and Telephones of all alterations which he proposes to make to his apparatus. This must not be changed without the previously obtained consent of the Administration of Telegraphs and Telephones.

This administration may, however, at any time, and for whatever cause, suspend or revoke the authorisations granted, without the payment of any indemnity whatsoever, or without giving any reason for such suspension or revocation.

This permission neither includes any privilege either for this particular authorisation or for any subsequent authorisation of the same nature.

It is not transferable without the express permission in writing of the Administration of Telegraphs and Telephones.

At the request of the Administration of Telegraphs and Telephones the applicant must

immediately place his apparatus out of working order.

ART. 9.—The applicant must hold himself responsible for all expenses and charges whatsoever, occasioned by permission granted to him.

ART. 10.—The applicant will pay a fixed annual fee of 20 francs for every authorised receiving station.

The first payment will be made before obtaining the authorisation; it will cover the remainder of any year from the day of the authorisation to the following December 31st.

Subsequent fees will be paid during the month of January of each year. No refund will be made by the Treasury no matter for what reason the use of the apparatus previously authorised be discontinued.

This applies equally in the case of the station being discontinued by order of the Administration of Telegraphs and Telephones.

ART. 11.—Stamp Duties and subsequent Registration Fees will be charged to the applicant.

Done at Brussels,

August 7th, 1920.

(Signed) P. POULLET,

The Minister.

The Administration of Telegraphs and Telephones will generally allow the use of amplifying valves and the reception of radio concerts. The regulations regarding broadcasting are now under consideration.

New Regulations are being drafted to replace the wartime regulations, and those relating to broadcasting stations are under revision.

REGULATIONS ISSUED 30TH AUGUST, 1924.

E REGARDING THE INSTALLATION, MAINTENANCE, INSPECTION AND SERVICE OF RADIOTELEGRAPHIC STATIONS ON BOARD BELGIAN VESSELS:—

I.—DOCUMENTS ON BOARD. The following documents must be kept on every station on board a Belgian vessel.

(1) The present regulations. (2) The International Radiotelegraphic Convention of 1912 and its service regulations; (3) detailed plans of the installation and the component apparatus; (4) the International list of radiotelegraphic stations and alphabetical list of call signs kept carefully up-to-date.

Ships included in the first two categories determined by article 66 of the Royal Decree prescribing the regulations for the application of law of 25th August, 1920, concerning the safety of ships must, beside, have on board the official nomenclature of telegraphic stations open for international service. This list need not necessarily be corrected to date but the supplements must be carefully classified for easy reference in case of need.

The licence delivered in accordance with article 65 of the Royal Decree of 8th November, 1920, must always be kept on board among the ships documents.

The operators must keep in their possession their certificate of proficiency during each of their voyages on the ships on which they serve.

II.—CONSTITUTION OF RADIOTELEGRAPHIC INSTALLATIONS TO BE FULFILLED. The installations must conform with the conditions stated in the International Radiotelegraphic Convention of London, 1912, and its annexes and every International Convention modifying or replacing that as well as the laws and decrees on this matter which are (see the annexes) or which may be put in force in Belgium supplementing the present rules.

The installations must be in perfect working order before the departure of the ship. The aerial particularly must be in place and on arrival it should not be dismantled before anchoring in port.

(a) *Transmitting Stations.* In order to allow the operator to keep proper observation of the output of the main transmitter and of the emergency set and to regulate this, the aerial-earth circuit must be furnished with a hot wire shuntless ammeter adapted specially to measure H.F. currents.

It must be possible to change quickly from the 600 metre wave to that of 300 metres and *vice versa*.

(b) *Receiving Apparatus.* In accordance with the service regulation annexed to the Convention of London (Article 7, C), the receiving apparatus must be arranged to receive, with the maximum possible protection against disturbances, the transmission upon the aforesaid wavelengths up to 600 metres. In addition the apparatus must be able to receive with sufficient protection against disturbances, transmissions operating on wavelengths up to 3,000 metres.

Sensitive and very stable detectors should be used.

The receiving apparatus must carry at least two detectors.

Care must be taken to avoid any induction arising from badly placed electric circuits or any other cause interfering with reception of weak signals.

Suitable arrangements must be provided to cut out the receiving telephones during transmission, whether this is being carried on by means of the main station or emergency set. A suitable buzzer must be conveniently placed to permit the perfect working of different circuits of the receiving apparatus and its detectors to be tested.

(c) *Emergency Transmitter.* The emergency installation must necessarily be fed by a battery and accumulators of sufficient capacity and voltage. If the principal transmitting station carries a battery and accumulators suitably arranged and situated, this battery (or a part of it) may serve for the supply for the emergency set.

When the emergency set carries a tuning inductance it must be possible to use it:—(a) for transmission on plain aerial; (b) for the transmission of tuned and slightly damped waves obtained by coupling the secondary of this coil with the condenser of the primary oscillating circuit of the main transmitter. An arrangement must be made to allow of quickly putting into circuit one or other of these methods of transmission. All precautions must be taken to provide that the emergency set may be put into use instantly.

III.—AERIALS.

(a) *General Conditions.* In addition to the principal aerial always in use there must be carried on board a single wire reserve aerial.

The aerials must always be kept in proper order as much as from the point of view of their soundness as of their electric resistance. Every aerial connection must, without fail, be soldered with the greatest care. Soldering must be done with resin and not with any liquid that might attack the metal.

Precautions must be taken that no strain is put on a soldered joint or on any part that has been heated. The same precautions must be taken in case of a repair to a broken wire. The bridles provided to suspend the spreaders must be very strong; in addition the aerial

wires must be attached to insulators without the intervention of hemp cords or similar material. The bridles must only be made of tarred rope if the different aerial wires are separately insulated.

(b) *Main Aerial.* This must be of the multi-wire type of a very solid construction. This aerial must be furnished with steadying guys suitably insulated, attached to the extremities of the spreaders to prevent swaying under the influence of rolling or wind.

(c) *Reserve Single-Wire Aerial.* In order to temporarily repair the breaking of the main aerial of which the re-erection is rendered impossible for a considerable time by bad weather or other circumstances and at the same time to keep up radiotelegraphic communication at a sufficiently long range, each ship must carry a single wire reserve aerial of suitable type and dimensions. This aerial must be rolled up upon a winder and furnished with insulators of an unbreakable type of rubber or rubber cord, etc., and placed in the wireless cabin conveniently for the operator. The two masts provided for its support must each carry a spare pulley block fixed as high as practicably possible and with a strong halliard employed exclusively for hauling up the single wire aerial. These halliards, pulleys and reserve insulators must be always kept in perfect order.

(d) *Metallic Stays.* The metallic stays of masts, triatic, etc., running more or less parallel and at short distance from the aerial wires must be effectively divided by insulators of great mechanical strength in such a manner as to avoid any considerable absorption of energy.

(e) *System.* The conductors should be connected to the earth system by means of an arrangement not presenting any appreciable ohmic resistance. This connection must be soldered.

IV.—GENERATING SET.

(a) *General.* The generating set must be constructed and placed in such a manner as to give continuous service. It must be very robust. Its power must be such that when al the apparatus in use, other than that of wireless, is normally in circuit, there still remains sufficient electric power to work the wireless apparatus. Necessary precautions must be taken to ensure that the voltage in the wireless cabin keeps reasonably steady; to this end the generator should be compound-wound.

In the interest of the safety of the ship, the generator set should be fixed, whenever possible, in the upper part of the engine room or, if an internal-combustion engine is used, near to the wireless station but not so near as to interrupt the operator.

(b) *Working.* The generating set must work continuously during the hours of watch and the current must always be at the disposal of the operator.

In every engineers' crew one man must be specially appointed to work and maintain the generating set and this is under no circumstances to be left to the operators.

(c) *Voltmeter and Ammeter.* The switchboard of the generating set must carry a voltmeter and an ammeter whose proper working is fully guaranteed. These instruments must be suitably placed and so lighted as to enable them easily to be read.

V.—POSITION OF THE WIRELESS CABIN.

(a) *Position.* The wireless station should, whenever possible, be installed on the upper bridge not so far aft that the throbbing of the screw may hinder the reception of weak signals.

A position should be selected well away from funnels, chains, or metallic stays and affording the best available shelter from spray.

(b) *Cabin.* The cabin must be solid, well fixed, perfectly watertight, of sufficient size to accommodate comfortably all the apparatus and, if required, the sleeping berths for the operators. It should be reasonably sound-proof to allow for the reception of weak signals. Finally, to avoid the detrimental effect of dampness on the apparatus, the cabin should be suitably warmed, due precaution being taken that no dust from the heating apparatus shall penetrate to the cabin or to the wireless apparatus.

The motor-alternator set of the transmitter should be enclosed in a cabinet sufficiently sound-proof to prevent its noise interfering with reception, which should proceed without the necessity of stopping the motor-alternator.

It is advisable to accommodate the operator in the wireless cabin as this arrangement ensures the quickest and most certain intervention of the radiotelegraphist in case of emergency and gives the greatest measure of safety.

If, from force of circumstances, the operators cannot have their berths in the wireless cabin, they should be lodged as near as possible to the wireless cabin and on one of the upper bridges.

The cabin should be provided with an emergency lighting system independent of the generating set on board (electric or paraffin lamps, candles, etc.); the operator should always have at hand this means of lighting. A hurricane lantern should also be at the disposal of the operator in the wireless cabin for the purpose of examining the outside gear (insulators, aerials, etc.) at night.

The operator should also have a portable electric lamp connected to the supply current through a fusible cut-out for the purpose of examining the apparatus and machines.

The wireless cabin must be provided with a ship's clock which should always indicate Greenwich Mean Time.

An iron ladder should allow easy and quick access to the roof of the wireless cabin to examine the aerial connections, the leading-in insulators, etc.

(c) *Means of Communication.* It is indispensable that the operator should not leave the wireless cabin and discontinue his listening to receive a communication from the officer on watch, to give him part of a message received, to request current, etc. It is also necessary that no third person should intervene during the transmission of these messages—this is always a source of dangerous errors. A telephone or speaking tube should be fixed between the wireless cabin and the bridge (chart-house).

If the operators have their sleeping berths in a place apart from the wireless cabin, an electric bell must be fixed in their sleeping cabin with the press-button in the wireless cabin in order to allow the operator on duty to summon the assistance of his sleeping colleague.

If there is only one operator and he sleeps in a cabin apart from the wireless apparatus, an electric bell should be fixed in his sleeping cabin with a press-button in the chart-room, so that the officer on watch may call the operator when he is not on duty.

These means of communication must always be kept in proper working order.

VI.—TECHNICAL CONDITIONS OF THE INSTALLATION.

(a) *Assembly and Mains.*

The main cables must be run with care and

be flexible cables insulated with two layers of vulcanised rubber, lead covered and with an insulation resistance of at least 1,000 megohms per kilometre. The cable must also be mechanically protected, especially where it would be liable to deteriorate from exposure, by a steel or iron pipe or some equivalent method.

A special lead running from the switchboard of the generator set must be provided for feeding the radiotelegraphic station. No other circuit must be connected to this lead except only a lighting circuit in the wireless cabin. Fuses must be provided in this case to protect it or the lamps.

A main switch double-pole cut-out must be fixed:—

(a) In the engine-room on the generator switchboard in the circuit supplying the wireless station.

(b) In the wireless cabin in the continuous-current supply circuit.

(c) In the wireless cabin in the primary alternating-current circuit.

Of the two cut-outs fixed in the continuous-current supply circuit, one on the generator switchboard and the other in the wireless cabin, the first should be decidedly stronger than the second in order to avoid replacing the fuses of the generator set whenever a short circuit or accident to the radiotelegraphic apparatus has blown out the fuses in the wireless cabin.

It is advisable to protect the operators from the broken ends of melted metal; for this reason the fuses should be of a protected type and of good quality.

The distributing switchboard of the wireless station must carry the necessary measuring instruments for indicating the working of the machines and wireless apparatus. It is, however, allowable to substitute pilot-lamps of suitable voltage for the D.C. and A.C. voltmeters in this switchboard.

The D.C. voltmeter—or pilot-lamp taking its place—should allow the operator to be assured that the generator on board is working well and that there is no interruption in the supply circuit of the wireless station.

(b) *Machines, Apparatus in Low-Frequency Circuit.* These machines and apparatus must be very carefully insulated with regard to rolling, both individually and all together. They must withstand a test for dielectric strain under a continuous tension of 1,000 volts applied for two minutes when cold.

(c) *High-Tension Apparatus.* The insulation must have and maintain a very high value. This apparatus must withstand the following test:—

The transmitter being worked with a local circuit—the aerial circuit being disconnected—each terminal of the secondary of the transformer, as well as the core and the metal casing, must be connected to earth successively and for two minutes at a time.

The machines and apparatus must be effectively protected against all surges due to the high frequency circuits.

(d) *Accumulator Batteries.* It is strictly forbidden to connect any circuit, for lighting, ventilation, etc., to the main accumulator battery or to the emergency battery or to remove the cells to other places to be used, for example, for lighting purposes, during a stoppage, etc.

Nevertheless it is allowable—if the station has this system of supply—to connect to the main battery a pilot-lamp taking the place of a voltmeter and an emergency light for the cabin, not consuming together more than 50 watts. The lamp circuit must be protected

with a special two-pole fuse. No pilot-lamp is allowed for the emergency battery but an emergency cabin lamp of 10 watts maximum power may be connected.

Operators will be held responsible for any misuse which may be made of their batteries.

The accumulator batteries must always be kept fully charged during the voyage. Care must be taken to ensure that they are fully charged before sailing and, as far as possible, to recharge them every day or every other day to make up for any power that may have been taken from them.

The distributing switchboard for the accumulators must carry:

(a) an ammeter showing the intensity of the charging and discharging current.

(b) a voltmeter, well calibrated, connected to the terminals of the battery.

The emergency battery being rarely employed, it is necessary to take measures to insure that it shall be kept in good condition and in working order.

For this reason, an arrangement must be made to discharge the cells through a resistance suitably regulated. The discharge should be done while in port and care taken to see that the battery is fully recharged immediately afterwards.

Steps must be taken to insure that the batteries shall be maintained in good condition during the intervals when the ship's dynamo is not running.

(e) *Tuning.* The tuning must be made for each of the two normal wavelengths (300 and 600 metres) and for each of the aërials (main and reserve single wire).

Diagrams showing clearly the different tuned positions must be displayed in the cabin in view of the operator.

(f) *Working.* The radiotelegraphists should be thoroughly acquainted with the working of their stations. They should be able to trace at once and without preliminary testing, the desired connections to bring into operation the emergency set, the emergency aerial, the different wavelengths, etc.

VII.—PERSONNEL OF OPERATORS.

Physical Conditions. Anyone inflicted with an infirmity or who has lost the use of a limb, either partially or totally, or who is lacking his full physical capabilities, must not be employed as an operator.

VIII.—SERVICE ORGANISATION.

(a) *Execution of Duties.* Operators are placed, for the execution of their radiotelegraphic duties, under the authority of the captain of the ship.

All messages received or intercepted regarding navigation as well as distress signals, must at once be brought to the notice of the officer on watch in their complete text; the operator is never to judge whether this kind of message is or is not of interest in the navigation of his vessel, the captain is sole judge in the matter.

(b) *Service Regulations in Cases of Distress.* In cases of distress the operator must immediately ascertain if the installations remain in good order, and are working properly and if the current of the ship's dynamo fails, must without losing a second, make the connections for the emergency set and see that the aerial is in order. A test with a plain aerial in circuit will show the operator at once the quality and insulation of an aerial. It is the absolute duty of a radiotelegraphist not to leave his post as long as there is any possibility of transmitting and receiving unless the captain has given him

special orders in view of the abandonment of the ship.

(c) *Transmission of Distress Signals.* While at sea the operator must be ready at all times to send out distress signals in the shortest possible time and with the maximum power and efficiency which circumstances permit and he will make his arrangements accordingly. Thus, for example, in the event of the ship's dynamo or the main set being out of action the emergency set should be permanently connected, etc.

The presence of mind of the operator is indispensable at the critical moment of an accident. On him may depend the lives of all the passengers and himself, as well as the safety of the ship and her cargo. He must never lose sight of the fact that it is useless to send out a distress signal without giving as exact an indication as possible of his position. Any error or modification in the position should also be transmitted.

If an operator does not receive any reply to his distress calls he must renew them after intervals for listening and give each time all useful indications.

In the event of an operator being assured that his calls are vain he may advisedly use his emergency set on plain aerial.

(d) *Log Book.* On each vessel the operators must keep a register with numbered pages in which must be entered in due order, stating the time (G.M.T.) and the name of the operator on duty:—

(1) The beginning and end of the watches of each operator, together with any interruption in the service, their duration and cause.

(2) Any unusual trouble with the transmitting or receiving apparatus, failure of the ship's supply, etc. The nature and cause of these accidents and the consequent interruption to the service resulting therefrom.

(3) The result of the periodic tests specified or statement of the reason why they could not be carried out.

(4) A note of all messages picked up between foreign stations and those which do not concern the ship. Simple records which will enable future reference and identification of such communications to be made are all that is required. *Example:* 17 h. 53 A B C de X Y Z

(5) The complete text of all messages concerning navigation intercepted and communicated to the officer of the watch.

(6) All distress-calls heard.

(7) Lastly, and if circumstances permit, in the event of accident, all details concerning the carrying on of the radiotelegraphic service (distress calls, replies, etc.).

IX.—MAINTENANCE AND TESTING.—Operators are responsible for the maintenance of the radiotelegraphic installations. The captain should allow them the assistance of the ship's crew necessary for assuring the maintenance of aërials, machines, etc. Every part of the radiotelegraphic station must be kept in perfect order, especially those subject to high tension currents.

In the event of trouble or damage of any kind to a machine or apparatus, this must be repaired at once and never left over to be done later.

Periodic Tests.

(1) The main transmitter and the emergency set must be tested every day. This test (signals or long dash), which must last long enough for the operator to be sure that all is in good order, should be made as follows:—

(a) With the main set and on the main aerial transmit a dash for several seconds. The reading of the aerial ammeter will show at once if the installation is working well (it is useless to prolong the dash until the pointer of the instrument becomes absolutely motionless).

(b) With the emergency inductance, excite the principal aerial in plain-aerial, a long white spark, fat and crackling will show that the aerial insulation is good. The transmission of a short dash is sufficient.

A time should be chosen when there is not much traffic between neighbouring stations and the time occupied by these tests must be as short as possible.

(2) Test the reserve detector every day.

X.—SPARES, TOOLS AND TESTING APPARATUS.

The radiotelegraphic station must invariably keep the following spares:—

A transmitting condenser complete (for primary circuit) of proper capacity and ready to be put into use.

A leading-in aerial-insulator or tube.

Aerial wire, insulators and accessories in sufficient quantity for the construction of a new main aerial.

A double headgear telephone and two leads.

Fuse wire or cartridge fuses.

Sundry cable and wire.

Sundry accessories and spare parts.

Operators must have a tool box with all necessary tools and especially soldering materials for aerials and apparatus.

They must also have for their use:—

A suction hydrometer complete for testing the specific gravity of the accumulator acid.

A portable voltmeter graduated from 0 to 3 or 4 volts for taking the voltage of separate accumulator cells.

A galvanometer for testing circuits.

XI.—SPECIAL REGULATIONS FOR SHIPS CARRYING VOLATILE AND INFLAMMABLE MATERIAL. On vessels coming within this category very special precautions are imposed. The wireless cabin must invariably be located in the upper bridge in such a way as to be well apart and ventilated, the insulation of the aerials and metallic stays must be carried out with especial care.

Supplementary precautions may be imposed according to circumstances.

ANNEXE.

Details to be furnished before obtaining a ship's station licence.

Application for a licence must be made by the owners of the vessels and not by the wireless contractors, and must be addressed to the Director-General of Telegraphs and Telephones, Place de la Monnaie, Brussels.

They must be accompanied by the following particulars:—

(1) Applicant.

Name of firm, name, christian names, address.

(2) Ship.

Name, means of propulsion (steam, sail or motor), gross tonnage, normal speed, nature of traffic, number of persons comprised in the crew, number of passengers for which the vessel is licensed, what is the longest distance which the vessel is liable to sail between two successive ports? Will it occasionally carry volatile and inflammable materials?

(3) Operation.

What Company will operate this station?

(4) Generating Set.

Place where installed, type of motor (steam petrol, paraffin, etc.), power, voltage, and method of excitation of the dynamo, power available for supplying the wireless stations.

(5) Wireless Installations.

Description of the different parts and layout of the proposed installation with plans of connections and apparatus. Description and plans must state if the proposed installations conform with the prescribed conditions. Power at the alternator terminals (voltage, watts), frequency, number of sparks per second, minimum day range guaranteed by the contractor, characteristics of the main battery, number of elements, voltage, capacity in ampere-hours. Type of emergency set, characteristics of emergency accumulator battery, number of elements, type, (mark), voltage, capacity, in ampere-hours, on the basis of a ten-hour discharge.

(6) Aerial.

Form and approximate dimensions of aerial.

(7) General arrangement of the station.

Location of (a) the wireless cabin; (b) the accumulator batteries; (c) the operators' sleeping accommodation.

(8) Proposed service particulars.

Call sign, normal range in nautical miles, system employed and nature of transmission, wavelengths, nature of service performed, working hours, ships charges per word in francs, ships charges, minimum per radio-telegram in francs.

BERMUDAS (THE)

(See Maps 35 and 46.)

A BRITISH Colony with representative Government, consisting of a group of 360 small islands (about 20 inhabited).

ADMINISTRATION.

There are two wireless stations working in the Colony. Wireless telegraphy is administered under the following enactments:—

A—The Wireless Telegraph Act, 1903.

B—The Wireless Telegraph Act, 1909.

THE WIRELESS TELEGRAPH ACT, 1903.

A From and after the passing of this Act it shall not be lawful for any person in these islands to transmit or receive messages across the seas (by an Act of 1910 this was amended by the addition of the words "or between places in these islands") by

means of any wireless telegraph, or to install, erect, construct, establish, or maintain in these islands any instrument, apparatus, or other thing for the purpose of transmitting or receiving such messages, unless such person shall hold a written licence from the Governor authorising the same, and such licence shall be in force and unrevoked; and any person who

shall offend against the provisions of this enactment shall be liable, on summary conviction before any two justices, for a first offence to a penalty not exceeding £25, and for a second or subsequent offence to a penalty not exceeding £100.

2. Any licence issued by the Governor under this Act may at any time be revoked by him by a written notice given to the person to whom such licence was issued, or by the publication of such revocation in the *Gazette*, and after such revocation such person shall not be entitled to any privilege or protection by virtue of such licence.

3. Any licence under this Act may be issued subject to such conditions and restrictions as the Governor may from time to time consider desirable in the public interest.

4. If any Justice of the Peace shall be satisfied from the information on oath of any credible person that there is good reason to believe that any of the provisions of the first section of this Act have been or are being violated, he may issue a search-warrant to any constable or constables authorising and requiring him or them, with or without assistants, at any hour of the day or night to enter into, and go through and search, inspect and examine any premises where such violation is suspected to have been or to be committed for the purpose of ascertaining whether such violation has been or is being committed; and if, upon such search, any instrument, apparatus, or other thing apparently used, or capable of being used, for the purpose of transmitting or receiving messages across the sea by wireless telegraphy shall be found, it shall be lawful for such constable or constables to seize and carry away, or otherwise to secure the same; and if, upon a hearing before any two Justices of the Peace, they shall adjudge and determine that any such instrument, apparatus, or other thing, has been used, or is capable of being used, for either of the purposes aforesaid, they may adjudge the same to be forfeited, and such forfeiture may be in addition to any penalty which may be imposed on any person under this Act in respect of such instrument, apparatus, or other thing.

5. Any instrument, apparatus, or other thing which shall be adjudged to be forfeited under the provisions of this Act shall be sold or otherwise disposed of in such manner as the Governor shall direct, and if sold the net proceeds of such sale shall be paid into the public treasury, after payment thereof of such reward, if any, as the Governor shall

award to the informer, or to any constable or constables executing the search-warrant under which such articles were seized.

6. This Act shall continue in force until and throughout the last day of December, 1907. (*By the Wireless Telegraphy Act Continuing Act, 1907, the Act of 1903 is continued in force indefinitely.*)

THE WIRELESS TELEGRAPH ACT, 1909.

The Governor having informed the Legislature that a despatch has been received from the Secretary of State for the Colonies drawing attention to the desirability of making Regulations as to the use of Wireless Telegraphy apparatus on merchant ships, whether British or foreign, while in the territorial waters of these islands, it was deemed expedient to confer on the Governor in Council the power to make such Regulations as may be necessary for the purpose aforesaid, and the following Act came into force in March, 1909:—

1. It shall be lawful for the Governor in Council to make regulations as to the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in the territorial waters of these islands, for preventing such apparatus being worked so as to interfere with naval signalling, or with the working of any wireless telegraph station lawfully established or worked in these islands, or with the transmission of messages between any such station and ships at sea.

2. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships, whilst in the territorial waters of these islands shall be subject to such further regulations as may be made by the Governor from time to time and such regulations may prohibit or regulate such use in all cases, or in such cases as may be deemed desirable.

3. Any regulations made under this Act may impose fines for any breach thereof not exceeding £20 for a single offence, and not exceeding £5 a day for a continuing offence, and such fines shall be recoverable with costs in any Court of Summary Jurisdiction consisting of any two Justices of the Peace.

4. All regulations made under this Act shall become operative on the date of their publication in the *Gazette*, or on such later date as shall be fixed by the regulations for the purpose.

BOLIVIA

(See Maps 48 and 52.)

THIS State possesses no seaboard, and, therefore, no maritime stations. The Government consists of a President, two Vice-Presidents and five Ministers of State.

CONTROL.

Wireless telegraphy forms at present a branch of the Posts and Telegraphs, which is administered by the State.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. Abdon Saavedra	Minister of Government and Public Works ..	La Paz
Mr. R. Villalobos	Director-General of Posts and Telegraph ..	La Paz
Mr. Humberto Asin	Chief of Radiotelegraphic Service	La Paz

ORGANISATION.

Bolivia entered the International Telegraphic Convention on June 1st, 1907, in the fourth category, and gave in its adherence to the International Radiotelegraphic Convention on October 29th, 1915.

At present the following stations are in operation : Viacha, which owing to its proximity to the capital is the first or central station of the Republic. It communicates with the Peruvian stations of Lima and Cachendo, and with the Bolivian stations of Riberalta, Yacuiba, Trinidad.

Riberalta has the same power as that of Viacha, communicating with the Brazilian stations of Porto Velho, Sena Madureira, the Peruvian stations of Yquitos and Cachendo, and the Bolivian stations of Viacha, Cobija, Trinidad, Villa Bella, Cachuela Esperanza and Guayaramerin.

Yacuiba, also, is of the same type as the two previous ones. Its service with foreign nations is with Asuncion (Paraguay), and it also communicates with Antofogasta (Chile), but its principal aim is to communicate with the stations known as the Pilcomayo stations, so named from their being situated on the banks of that river.

Trinidad communicates with the stations of Viacha and Riberalta.

Cobija communicates with Riberalta and the Brazilian station of Xapury.

The stations called the Pilcomayo stations are installed at the small military forts of Ballivian, D'Orbigny and Esteros.

A radiotelegraphic school was established during 1917 in La Paz, under the direction of Mr. Asin, the Superintendent of Radiotelegraphy. There are no wireless clubs or societies in the Republic.

ADMINISTRATION.

At present no special laws or regulations have been passed for the administration of wireless, but a Bill for that purpose is in course of being drafted.

BRAZIL

(See Maps 48 to 53)

CONTROL.

THE radiotelegraphic stations of the country are exclusively under the control of the Government, and their administration is regulated by the Minister of Public Works with respect to installations of a civil character, and by the Ministers of State for War and the Navy with respect to installations destined for national defence and the services of the military and naval forces.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.
Dr. Francisco Sá	Minister of Public Works
Dr. Paulo Neves Moraes Gomide	Director-General of Telegraphs
Admiral Alexandrino de Alencar	Minister of Marine
Capt. Tenente Mario de Barros Barreto	Chief Naval Radio Service
General Setembrino de Carvalho	Minister of War
Lt. Aranha de Vasconcellos	Chief of Army Radio Service

ORGANISATION.

There are no direction finding stations, but time signals and meteorological bulletins are sent out from the Ilha do Governador Naval Radio Station in accordance with the Eiffel Tower programme.

Amateurs are now allowed to install receiving stations. A station has been installed in the Telegraph Pavilion at Praia Vermelha for broadcasting

market reports and weather bulletins. Another station will be installed at Belle Horizonte, the capital of the state of Minas Geraes. The Radio Society of Rio de Janeiro has also been granted permission to install a broadcasting station, and further stations are contemplated for São Paulo and Pernambuco.

Meteorological reports and bulletins are transmitted free to all ships by the coast stations under the control of the Telegraph Department.

The stations working up to August, 1923, comprise:—

Coast Stations controlled by the Ministry of Public Works . .	6
Inland Stations controlled by the Ministry of Public Works	10
Coast Stations controlled by the Ministry of War	7
Coast Stations controlled by the Ministry of Marine	13
Coast Stations controlled by the Ministry of Agriculture . .	1
Naval Ship Stations	35
Merchant Ship Stations	140

A new high power station is in course of erection in Rio de Janeiro for transoceanic communication.

The Radio Society of Brazil has been formed with Dr. Henrique Morize, Director of the National Observatory, as President.

ADMINISTRATION.

A Commission composed of members of the Civil, Naval, Military and Educational authorities are studying the Decree, No. 3,296 of July 10th, 1917, with a view to modifying it. The regulations for administering this law are nearing completion.

No regulations have yet been published regarding Aviation.

The following laws and regulations govern the administration of wireless in the Republic—

A—Extract from Act relating to the Brazilian Merchant Service.

B—Extract from Law No. 2,719 of December 31st, 1912.

C—Law 2,738 of January 4th, 1913.

D—Decree No. 3,296 of July 10th, 1917.

ACT RELATING TO THE MERCHANT SERVICE.

A The following Articles refer to Wireless Telegraphy:—

ART. 159.—Those boats must without exception be provided with radiotelegraphic apparatus, approved by the General Direction of Telegraphs, with the necessary power to allow of communication with the wireless stations in the zones in which they trade, when:

(a) They carry passengers and are employed in the coastal trade, or any description whatsoever, and have a registered tonnage of over 300 tons, and for those boats employed in river trade having a registered tonnage of over 500 tons.

(b) They are only employed in the coastal trade as cargo boats, but carry over 30 (thirty) souls all told.

ART. 160.—After the promulgation of this regulation, no ship shall be registered by any Port Authority if it has not complied with the regulations of the preceding Article, the licence to navigate being refused to any ship which, within one year from the date of the promulgation of this regulation, shall not have fulfilled the depositions set forth herein.

LAW No. 2,719.

DECEMBER 31ST, 1912.

B The above Law fixes the Coast Tax at 6 francs for a telegram up to 10 words, and 60 centimes for each extra word. Included in the rate is the transmission between a coast station and the telegraph stations to

which the wireless station is directly joined up.

There is a land telegraph charge (*via* National lines) of 25 centimes a word without minimum on telegrams destined to telegraph stations which are not directly connected up with a coast station.

For telegrams exchanged between Brazilian coast stations and ships flying the Brazilian flag the ship tax has been fixed at 240 reis a word with a minimum of 10 words, the coast tax at 400 reis a word with a minimum of 10 words, and the land telegraph charge (if any) at 200 reis a word without a minimum.

LAW No. 2,738.

JANUARY 4TH, 1913.

C A new wireless district was created by the above Law, with a credit of 732 contos, to include the Acre, Amazonas, and Para wireless stations, and these stations have since been taken over by the Telegraph Department and opened to public traffic.

WIRELESS LAW No. 3,296.

JULY 10TH, 1917.

D The National Congress resolves:—
ART. 1.—The service of radiotelegraphs (telegraphs without wires) in the territories and territorial waters of Brazil is exclusively within the sphere of federal Government.

Sole Paragraph.—The service of radiotelegraphy comprises also radiotelephony (telephones without wires).

ART. 2.—The establishment and exploitation of radiotelegraph stations are within the sphere of the Ministry of Public Works, in respect to its application of a civil character and the Ministries of War and Marine in reference to its applications destined to national defence and to the service of the Army and Navy.

Sole Paragraph.—The three above-mentioned Ministries will enter into an agreement in respect to the localities in which must be established the stations necessary for commerce, for navigation and for the defence of the national territory.

ART. 3.—The Government may give permission to third parties, nationals, without monopoly whatsoever, to install or work one or more high-power stations in suitable places on the littoral; under the terms of the International Regulations concerning wireless telegraphy and also the Brazilian regulations which are in force for the execution of the same service; for the exclusive purpose of establishing inter-oceanic and inter-territorial communications with corresponding stations in other countries.

Par. 1.—These stations must be linked with the National Telegraphs, by whose intermediary shall be collected and distributed the international radiotelegraphic service to and from Brazil in such a manner that the Government shall receive the terminal rate in force.

Par. 2.—The rights that are conferred and the disposals contained in this article may only be used by the Government after the conclusions adopted in respect to this subject by the International Pan-American Convention, which at the recent conference in Buenos Aires was arranged should be held at Washington in 1917.

ART. 4.—The States within the area of their territories which are not yet served by telegraphs with or without wires, and may wish to establish radiotelegraphic stations, shall interest the Department of Telegraphs to install and work them, debiting the respective costs against such States, and for the purposes of the adjustment of the accounts shall be considered as mutual traffic administrations with the Department.

ART. 5.—The National shipping companies whose steamers have accommodation for more than 50 passengers and whose voyages are longer than 150 miles from the port of origin of its ships and the site of the registered office of the company must install on board of such steamers a radiotelegraphic station with a minimum range of 100 nautical miles, which shall be worked by an operator who holds a certificate of fitness granted by competent authority. The installations on board shall be provided with emergency apparatus and battery which will permit a continuation of the service in case of the failure of supply of electrical energy by the generators that depend on the main installation.

ART. 6.—Foreign ships will be permitted within or without the territorial waters of Brazil to use the radiotelegraphic stations which they have mounted on board to correspond with the coastal stations erected by the Department of Ways and Public Works previously being authorised by the same Ministry or the Department to this end and subject to the prescriptions and regulations governing this service.

Paragraph.—Foreign warships will be licensed by the authority designated by the Minister for Marine.

ART. 7.—The establishment and working of the coastal radiotelegraphic stations and others of a civil character in the interior of the country will be entrusted to the Department of Telegraphs, to which will fall the duty also of the superintendence and carrying out of all the service of fiscalisation in relation to the employment of this kind of telegraph system by the State by national shipping companies whether by fixed or moving stations and the execution of administrative acts, the promulgation of the dates of openings, the range and the class of each station and the inauguration of proceedings relative to misdemeanours committed against this branch of the service.

Sole Paragraph.—The said Department shall create a special section to which shall be entrusted the management of the service, and also it shall form a school of radiotelegraphy and it shall have authority to contract within or without the country with a professional teacher to take charge of the said school. The only persons qualified or admissible for the personnel of the said radiotelegraphic stations shall be nationals, holders of a certificate of competency issued by the above school, or by other holders of diplomas, admitted to work in the country.

ART. 8.—Also the radiotelegraphic stations that were established in Brazilian territory and on board of national ships and on board of foreign ships whilst they remain or navigate on the rivers or territorial waters of Brazil, and claim to establish communication with the national stations for this purpose authorised, must be subject to the rules and regulations of the interior and international services that may be in force.

ART. 9.—Radiotelegraphic correspondence is authorised between national mercantile ships and also between them and foreign ships that possess radiotelegraphic stations aboard as well as between the said ship and the Brazilian coast stations dependent upon the Ministry of Public Works.

ART. 10.—Whatever concession to persons for the establishment of a radiotelegraphic service or whatever authorization given to use the respective apparatus installed on board foreign ships may be revoked if they do not comply with the rules and regulations or if the Ministries of Marine and War judge it necessary for the security of the country or its defence.

ART. 11.—When the civil or military Federal authorities dependants of the Ministries referred to in Art. 2 have to make scientific or technical experiments in radiotelegraphy they must give notice to the Ministries to which they depend, and when they make experiments on behalf of functionaries of other Ministries, then they must give notice to the Ministry of Ways and Works.

ART. 12.—No other besides the Federal authorities may make experiments or establish experimental radiotelegraphic stations without previous permission of the Ministry of Ways and Public Works, who can give the same with the restrictions and cautions necessary for the security and interests of the State and the efficiency of the traffic of the official stations.

ART. 13.—All the rules and regulations of the Department-General of Telegraphs shall apply to the service of radiotelegraphy with reference to the secrecy to telegrams and as to damages caused to the stations or their material.

ART. 14.—The Government will proceed in the terms of the legislation in force against those who, without permission, exploit, whether publicly or clandestinely, a radiotelegraphic service, and in time of the disturbance of

public order or external war these offences shall be classified and punished in the first case as an act of resistance to constituted authority and in the last case as an act of spying.

ART. 15.—Those coastal and interior radiotelegraphic stations which are dependencies of the Ministry of Ways and Public Works, and not reserved for special purposes, will be open for public correspondence.

Sole Paragraph.—No responsibility will be accepted by the radiotelegraphic service for errors of the service or faulty delivery of telegrams, in the terms of Art. 41 of the regulations revised in London.

ART. 16.—Any Brazilian radiotelegraphic station, whether civil or military, terrestrial or marine, will be obliged to give preferential attention to calls for succour that are received by them.

ART. 17.—In all radiotelegraphic stations the public service shall have preference to private service, save in case of *force majeure* (accidents and calls for succour).

ART. 18.—Whatever be the object for which radiotelegraphy be established the respective services shall be organised in a form not to cause disturbance to other radiotelegraphic stations, and the respective Ministries shall in all cases adopt provisions and rules necessary to such end.

ART. 19.—Radiotelegrams proceeding from a ship which flies the flag of a non-adherent country to the regulations upon radiotelegraphs of the Convention of London as well as those addressed to ships of such countries shall be transmitted by Brazilian stations only in cases where the respective country has previously declared that it will conform to those rules and regulations in the adjustment of accounts.

ART. 20.—When the Ministries of Marine or War have to establish radiotelegraphic stations for special ends in strategic points and fortified places on land or sea, they will proceed in agreement with each other and with the Ministry of Ways and Public Works when choosing of the site and deciding upon the manner of carrying out the work, to the end that they shall not interfere with their mutual traffics.

These stations may be worked by telegraphists of the civil administrations.

Whilst civil functionaries man the stations established in strategic or fortified places they shall be subject to military regime.

ART. 21.—All coastal radiotelegraph stations worked by the Department of General Tele-

graphs must receive and transmit meteorological observations, and there must be provided installations at one or more stations of the apparatus necessary to transmit time signals in the manner established by the Time Conference held in Paris in October, 1912.

Sole Paragraph.—The national ships provided with apparatus for wireless telegraphy and the foreign ships in the same condition can signal to the coast stations when they are within reach of them their observations about the weather, which will be communicated to the Meteorological Observatory of Rio de Janeiro, and to the ships, on the other hand, will be communicated the observations from that Observatory.

ART. 22.—To the radiotelegraphic service of Brazil are applicable the International Radiotelegraphic Convention held in London and the rules which may be laid down for the execution of the present law.

ART. 23.—The adjustment of accounts shall be made six-monthly between the Department General of Telegraphs and the agencies of the companies of national and foreign ships, and in their absence with the administrations to which those ships are attached in accordance with what is established by Art. XLII of the International Regulations (revised in London).

ART. 24.—The call letters of the stations on board the national war and merchant ships will be distributed by the Department of General Telegraphs in accordance with the series of indicators reserved for Brazil by the Secretary of the International Union of Telegraphs of Berne.

ART. 25.—The radiotelegraphic stations in the interior of the country shall be established and worked by the Department of General Telegraphs, organising proper radiotelegraphic districts in regions where there are none, connecting them with the telegraphic service by means of wired lines and working with a parallel service of wired telegraphs.

ART. 26.—Annuling all whatsoever acts in this connection effected by the Government prior to the promulgation of the present law.

ART. 27.—It shall be the sphere of the Ministry of Ways and Public Works to make provision for the establishment and initiation of an international radiotelegraphic service with the adjoining countries as well as the drawing up of the basis of a definite agreement and referendum to the National Congress.

ART. 28.—All previous acts to the contrary are revoked.

BRITISH GUIANA

(See Maps 48 and 51)

Including : Demerara.

CONTROL AND ORGANISATION.

Both the ownership and working of all radiotelegraphic stations are vested in the Government. Only one station is open for public correspondence with ships.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
H. G. Spain, M.Am.I.E.E., M.I.R.E.	Officer-in-Charge, British Guiana Wireless Department	Georgetown, British Guiana

ADMINISTRATION.

The administration of wireless telegraphy is carried out under the following regulations:—

A—The Telegraphic Ordinance, 1903.

B—Ordinance No. 7 of 1910.

A This Ordinance may be cited as "The Telegraph Ordinance, 1903."

2. In this Ordinance "telegraph" means an electric, galvanic, or magnetic telegraph and includes appliances and apparatus for transmitting or making telegraphic, telephonic or other communication by means of electricity, galvanism or magnetism, whether the same be transmitted by means of wires or cables or without wires or cables.

3. The Governor-in-Council shall have the exclusive privilege of establishing, maintaining and working telegraphs between the Colony and places outside of the Colony.

Provided that the Governor-in-Council may grant a licence on such conditions and in consideration of such payments as he thinks fit, to any person, company or body corporate, to establish, maintain or work a telegraph between the Colony and any place or places outside the Colony; and

Provided that nothing in this Ordinance shall apply to or in any way affect the rights already granted to the West India and Panama Telegraph Company, Limited, under any Ordinance or Ordinances passed before the commencement of this Ordinance.

ORDINANCE No. 7 of 1910.

B 1. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any British ship registered in the Colony, except under and in accordance with a licence granted in that behalf by the Governor-in-Council.

(2) A person shall not work any apparatus for wireless telegraphy installed on any merchant ship (whether British or foreign) whilst that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations made in that behalf by the Governor-in-Council, and the Governor-in-Council may by any such regulations, impose penalties recoverable summarily for the breach of any such regulations, not exceeding fifty dollars for each offence, and may provide for the forfeiture on any such breach of any apparatus

for wireless telegraphy installed or worked on such ship.

(3) If any such person establishes a wireless telegraph station without a licence in that behalf, or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be guilty of a misdemeanour and be liable on summary conviction thereof to a penalty not exceeding fifty dollars, and on conviction on indictment, to a fine not exceeding five hundred dollars, or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence.

(4) If a Justice of the Peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship within his jurisdiction without a licence in that behalf or contrary to the provisions of the regulations made under sub-section two of this section, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Governor or the Postmaster-General and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

(5) The expression "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: Provided, That nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. This Ordinance may be cited as the Wireless Telegraph Ordinance, 1910.

BRITISH HONDURAS

(See Maps 43 and 44.)

CONTROL.

THE ownership and working of the one radiotelegraphic station at Belize, in the Crown Colony of British Honduras, is vested in the Government. It is open for continuous ship service and has a 25 kW. arc transmitter, the intention being to bridge the Admiralty station at Jamaica. An experimental licence has been granted to St. John's Roman Catholic College in Form 2 issued by H.B.M. Postmaster-General in 1905.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. Gerald S. W. Smith ..	Colonial Postmaster	Belize
Mr. James Owen Hall ..	Superintendent of Wireless Telegraphs ..	Belize.

Laws are being prepared for the regulation of private stations in accordance with the London Convention of 1912.

ADMINISTRATION.

Wireless telegraphy in British Honduras is regulated by Chapter CXCIX of the Consolidated Laws of British Honduras (revised edition), the text of which will be found below.

A—Consolidated Law.

B—Regulations.

C—Licence to use Wireless Telegraphy for Experimental Purposes.

CHAPTER CXCIX OF THE
CONSOLIDATED LAWS OF BRITISH
HONDURAS (REVISED EDITION).
TO REGULATE WIRELESS TELEGRAPHY.

A 1. *Interpretation.*—In this chapter “Wireless Telegraphy” means any system of communication by telegraph without the aid of any wires connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. *Licence to Install, &c., Wireless Telegraphic Apparatus.*—(1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine and shall contain the terms, conditions and restrictions on any subject to which it is granted.

3. *Apparatus not to be worked on merchant ships except in accordance with regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this chapter.

4. *Regulations.*—(1) The Governor may from time to time make regulations for carrying into effect the purpose of this chapter, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this chapter.

(2) The regulations in the schedule to this chapter shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. *Search Warrants.*—If a District Commissioner is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf

or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship contrary to the provisions of this chapter or of any regulations made under this chapter, or of any licence granted under this chapter, he may grant a search warrant to any police officer or any person appointed in that behalf by the Superintendent of Police and named in the warrant and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. *Penalty for contravention of chapter.*—(1) Any person who shall offend against any provision of this chapter or any regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding two hundred and fifty dollars, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) *Procedure.*—Proceedings shall be taken before the District Commissioner for the Belize District on the complaint of the Superintendent of Police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

SCHEDULE—Section 4 (a).

REGULATIONS.

B i. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Navalsignalling, or

(b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

ii. In these regulations “naval signalling” means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

iii. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

iv. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

v. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

vi. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

LICENCE TO USE WIRELESS TELEGRAPHY FOR EXPERIMENTAL PURPOSES.

EXPERIMENTAL FORM 2.

Dated

C This Indenture made the
day of One thousand
nine hundred and

between the Colonial Secretary of the Colony of British Honduras on behalf of the Government of British Honduras of the one part and (hereinafter called "the licensee") of the other part.

Whereas the licensee is desirous of establishing installing and working an amateur wireless telegraph apparatus for demonstration purposes with the sole object of giving instruction in the Science Classes of Saint John's College;

And whereas by reason of the provisions of Chapter 199 of the Consolidated Laws (Revised Edition) it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place except under and in accordance with a licence granted in that behalf by the Governor and it is also unlawful save as in the said Law provided to transmit wireless telegrams within the Colony;

And whereas at the request of the licensee the Governor has agreed to grant to the licensee the licence powers and authorities hereinafter expressed and contained for the period upon the terms and subject to the stipulations and conditions hereinafter appearing;

Now this Indenture witnesseth that in consideration of the premises and of the matters hereinafter appearing it is hereby agreed and declared between and by the parties hereto and the licensee (as to the covenants and agreements hereinafter contained on his part) doth hereby covenant and agree with the Colonial Secretary and the Colonial Secretary (as to the covenants and agreements hereinafter contained on his part) in exercise of all powers and authorities enabling him in this behalf doth hereby covenant and agree with the licensee in manner following (that is to say):—

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in Chapter 199 of the Consolidated Laws (Revised Edition).

The expression "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or Naval

Station and any other wireless telegraph station whether on shore or on any ship.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland..

2. Subject to the provisions of this Indenture the licensee shall during the term or period commencing on the and terminating on the have licence and permission from the Colonial Secretary—

to establish install and work at the station specified in the Schedule hereto apparatus for wireless telegraphy (hereinafter called "the licensed apparatus") provided that the apparatus installed at such station shall be of the character specified in the said Schedule.

3. The licensed apparatus shall not be used by the licensee or by any person either on his behalf or by his permission for any purpose except for the purpose of conducting experiments in wireless telegraphy.

4. (1) The licensed apparatus shall be so worked as not to interfere with the working of any wireless telegraph station established in the Colony or the territorial waters abutting on the coasts thereof and in particular with the transmission or receipt of any messages between or at any wireless telegraph station established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the licensee and any person acting on his behalf or by his permission shall comply with all directions, which shall be given to the licensee by the Colonial Secretary with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not without the consent in writing of the Colonial Secretary be altered in respect of any of the particulars mentioned in the Schedule hereto.

5.* (1) The licensee shall not (either by himself or by any person acting on his behalf or by his permission) by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(2) Whenever the operators at the station of the licensee perceive through the medium of the instruments used by them that naval signalling is proceeding they shall refrain from using the licensed apparatus until all indications that naval signalling is proceeding shall have ceased.

(3) The licensee and any person acting on his behalf or by his permission shall if so required in writing by the Colonial Secretary cease to use the licensed apparatus.

(4) If the Colonial Secretary is of opinion that the working of the licensed apparatus at the station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall when required in writing by the Colonial Secretary close the said station.

(5) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this indenture.

6. Neither the licensee nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use what-

* This clause will be omitted in the case of inland installations.

ever of any message coming to the knowledge of the licensee or any such person as aforesaid and transmitted by naval signalling or by any system of wireless telegraphy provided or maintained by the Government of the Colony.

7. The Colonial Secretary and his engineers and agents may from time to time and at all reasonable times enter upon the station or other premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such places respectively and the licensee shall afford all requisite and proper facilities for such inspection and shall secure to the Colonial Secretary the right for the purpose aforesaid of entry from time to time into and on such station and premises as may be in the possession or occupation of any person or persons other than the licensee.

8. All apparatus used or intended to be used under this licence shall be so erected fixed placed and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance working or user of any telegraphic line of the Colony.

9. If and whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by Wireless Telegraphy it shall be lawful for the Governor by warrant under his hand to direct and cause the licensed apparatus to be taken possession of in the name and on behalf of His Majesty.

10. The Colonial Secretary may at any time with the Governor's approval give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the

licence or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Colonial Secretary under any covenant or provision herein contained on the part of the licensee to be observed and performed.

11. In case of any breach non-observance or non-performance by or on the part of the licensee of any of the covenants or conditions herein contained and on the part of the licensee to be observed and performed the Colonial Secretary may by writing revoke and determine these presents and the licence powers and authorities hereinbefore granted and each and every of them and thereupon these presents and the said licence powers and authorities and each and every of them shall absolutely cease determine and become void.

Provided always that no such revocation or determination as aforesaid shall prejudice or affect any right of action or remedy which shall have accrued or shall thereafter accrue to either of the parties hereto under the covenants herein contained.

12. Any notice request or consent (whether expressed to be in writing or not) to be given by the Colonial Secretary under these presents may be served by sending the same by registered post letter to the licensee and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Colonial Secretary.

Signed on behalf of the Government of British Honduras,

Colonial Secretary.

Witness.

Signed by the licensee on behalf of Belize, British Honduras.

Licensee.

Witness.

THE SCHEDULE BEFORE REFERRED TO:—

Name of Station.	CHARACTER OF APPARATUS.		
	Maximum Range of Signalling with the Licensee's Own Apparatus.	Power (Current and Voltage).	Source of Power.
(1)	(2) — miles	(3) Current and Voltage ..	(4) Batteries

BRITISH NORTH BORNEO

(See Maps 17, 21 and 22).

Including : Brunei.

THIS territory is under the jurisdiction of the British North Borneo Company, being held under grants from the Sultans of Brunei and Sulu. (Royal Charter in 1781). The territory is administered by a Governor (appointed with the approval of the Secretary of State) in Borneo and a Court of Directors in London, appointed under the Charter. On May 12th, 1888, the British Government proclaimed a formal protectorate over the State of North Borneo,

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. C. F. Newton Wade, A.M.I.R.E.	Postmaster-General and Superintendent of Telegraphs	Jesselton.
Mr. H. A. Dabell	Assistant Postmaster and Assistant Super- intendent of Telegraphs	Sandakan.
Mr. G. C. Fenton	Assistant Postmaster and Assistant Super- intendent of Telegraphs	Sandakan.

ORGANISATION.

There are at present seven land stations in British North Borneo controlled by the Government, and three in Brunei. There are no Amateur or Experimental Wireless Stations or Clubs and no Amateur Stations are at present licensed.

ADMINISTRATION.

Wireless telegraphy is administered in accordance with the provisions of the following ordinance:—

A—Wireless Telegraphy Proclamation, 1914.

WIRELESS TELEGRAPHY PROCLAMATION, 1914.

A British North Borneo has been included as a party in the International Radiotelegraphic Convention.

The following proclamation controls the use of wireless telegraphy:—

1. This proclamation may be cited as "The Wireless Telegraphy Proclamation, 1914," and shall come into force upon the publication thereof in the *Gazette*.

2. (i) In this proclamation the expression "wireless telegraphy" means any system of communication by telegraph as defined by "The Telegraph Proclamation, 1901," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received;

The expression "locally owned ship" means a ship owned wholly by the Government or by bodies corporate established under and subject to the laws of this State, and having their principal place of business within this State.

(ii) Nothing in this Ordinance shall prevent any person from making or using apparatus other than for the purpose of the transmission or reception of messages or for the radiation of electrical energy or waves.

3. The Governor may, whenever he shall deem it expedient to do so, licence the establishment of any wireless telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in this State or on board any locally owned ship.

4. (i) No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place in this State or on board any locally owned ship except under and in accordance with a licence granted in that behalf by the Governor.

(ii) Every such licence shall be in such form and for such periods as the Governor may determine, and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as the Governor shall consider desirable in the public interest.

5. (i) Any person establishing a wireless telegraphy station without a licence in that behalf, or installing or working any apparatus for wireless telegraphy without a licence in that behalf, shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding

twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, provided that no proceedings shall be taken against any person under the proclamation except with the previous sanction of the Governor.

(ii) On being satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf, a magistrate may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (i) The Governor may make and, when made, vary or cancel rules more particularly for all or any of the following matters:—

(a) For prescribing the form and manner in which applications for licences under the proclamation are to be made;

(b) For prescribing the fees payable on the grant of any licence;

(c) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship or a British or a foreign ship, in the waters of this State shall be worked so as to prevent the interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in this State or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) For prohibiting, except with the special or general permission of the Superintendent of Telegraphs, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship or a British or a foreign ship, whilst such ship is in any of the harbours of this State;

(e) For prohibiting or regulating, in case at any time in the opinion of the Governor

an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether locally owned ships or British or foreign ships, in the waters of this State, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time, either in all cases or in such cases as may be deemed desirable;

(f) And generally for the more effectual carrying out of the provisions of this proclamation.

(ii) No rules made in respect of the matters described in paragraphs (c), (d), and (e) of sub-section (i) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. On an application for a licence proving to the satisfaction of the Governor that the whole object of obtaining the licence is to

enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted to such applicant, subject to such special terms, conditions, and restrictions as the Governor may think proper that such licence shall not be subject to any rent or royalty.

8. (i) Every omission or neglect to comply with, and every act done or attempted to be done contrary to, the provisions of the proclamation, or of any rule made thereunder, or in breach of the conditions and restrictions subject to or upon which any licence has been issued, shall be deemed to be an offence against, not otherwise specially provided for, the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(ii.) All convictions, forfeitures, and fines under this proclamation, or any rules made thereunder, may be had and recovered before the Court of a Magistrate of the First Class.

BRITISH SOMALILAND (Protectorate)

(See Maps 25 and 30).

THE Somali coast is administered by a British Governor. Egyptian control ceased in 1884, and the territory then fell under the administration of the Indian Government. It was taken over by the Foreign Office on October 1st, 1898, and was transferred to the Colonial Office on April 1st, 1905.

CONTROL.

The control of wireless telegraph operations is vested in the Posts and Telegraphs Department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. C. R. Keyte	Director of Posts and Telegraphs	Berbera
Mr. C. V. Magill	Assistant Director of Posts and Telegraphs ..	Berbera
Mr. G. G. Kellie	2nd Assistant Director of Posts and Telegraphs..	Berbera
Mr. G. B. Jones	Engineer	Berbera

ORGANISATION.

The first stations were erected in 1910 at Berbera and Aden (on the Asiatic coast), the latter being in telegraphic communication with the Eastern Telegraph Company's Aden Station. Subsequently other stations were erected, at Burao, Hargeisa and Zeyla.

We append the text of the following:—

A—Wireless Telegraphy Ordinance, 1913.

B—Regulations thereunder.

ORDINANCE.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."
2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which messages

or other communications are sent or received. Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or install or work

any apparatus for wireless telegraphy in any place or on board any ship registered in the Protectorate, except under and in accordance with a licence granted in that behalf by the Commissioner.

(2) Every such licence shall be in such form and for such period as the Commissioner may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Protectorate, otherwise than in accordance with regulations under this Ordinance.

5. (1) The Commissioner may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication have the same effect as if enacted in this Ordinance.

(2) The regulations in the schedule to this Ordinance shall have effect in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Commissioner, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Protectorate shall be subject to such further regulations as may be made by the Commissioner from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf or contrary to the provisions of any regulations made under this Ordinance, or of any licence granted under this Ordinance, he may grant a search-warrant to any Police Officer or any person appointed in that behalf by the District Commissioner and named in the warrant, and a warrant so granted shall authorise the Police Officer or person named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to fine not exceeding rupees seven hundred and fifty, and upon such conviction the Court

may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before the District Court, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphs Ordinance, 1908, is hereby repealed.

SCHEDULE.—SECTION 5 (2).

REGULATIONS.

B i. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Protectorate shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(i) The working of any wireless telegraph station lawfully established, installed or worked in the Protectorate or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless stations established on ships at sea.

ii. In these regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

iii. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Protectorate, except with the special or general permission of the Commissioner.

iv. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

v. Any summons or other document in any proceedings under these regulations shall be deemed to have been served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

vi. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

BRITISH WEST INDIES

(See maps 39, 40, 45 and 46).

BAHAMAS

CONTROL AND ORGANISATION.

IN 1912 a scheme of linking up the out-islands of the Colony with Nassau by radiotelegraphy was started and stations were installed on the Islands of Eleuthera, Bimini, Harbour-Island, and Inagua. Stations have also been erected at Elbow Cay and Norman's Castle on Abaco Island, and at West End Grand Bahamas.

All land stations are controlled by the Governor in Council.

There are no time, meteorological, hydrographic or press services or direction finding stations.

Licences are issued to those wishing to operate Radiophone receivers for concert and entertainment purposes.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
P. H. Burns	Superintendent Telegraphs & Telephones.	Nassau, N.P.

ADMINISTRATION.

The Radiotelegraph Act, 1913, regulates the administration of wireless telegraphy.

A—Radiotelegraphic Act, 1913.

B—Rules made thereunder.

RADIOTELEGRAPHIC ACT, 1913.

3 AND 4 GEORGE V, CHAPTER 7.

AN ACT

FOR ESTABLISHING RADIOTELEGRAPHIC COMMUNICATION IN THE COLONY AND BETWEEN THE COLONY AND PARTS BEYOND THE LIMITS OF THE COLONY.

(Assented to 7th July, 1913.)

A May it please the King's Most Excellent Majesty that it may be enacted and be it enacted by His Excellency George Basil Haddon-Smith, Esquire, Companion of the Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief in and over the Bahama Islands, the Legislative Council and Assembly of the said Islands, and it is hereby enacted and ordained by the authority of the same as follows :—

1. This Act may be cited as the Radiotelegraph Act, 1913, and together with the Telegraph Act, 1891, and the Acts amending the same, may be cited as the Telegraph Acts, 1891 to 1913.

2. In this Act unless the context otherwise requires :—

“Rules” means Rules made under this Act.

“Superintendent” means the Superintendent of Telegraphs and Electrical Engineer.

3. (1) It shall be lawful for the Governor in Council—

(a) To make all necessary arrangements for securing, establishing and maintaining a radiotelegraph station in New Providence for radiotelegraphic communication between New Providence and other parts of the Colony and parts beyond the limits of the Colony and for such purpose to make and enter into any contract as may be requisite: The contract entered into on the 3rd day of December, 1912, between the Crown Agents for the Colonies acting for and on behalf of the Government of the Colony, and the Anglo-French Wireless Telegraph Company, Ltd., shall be deemed to be a contract entered into under the provisions of this Act.

(b) With any funds that may hereafter from time to time be specifically granted by the Legislature for the purpose to make all necessary arrangements for securing, establishing and maintaining a radiotelegraph station in any Out Island for radiotelegraphic communication between such Out Island and any other parts of the Colony and parts beyond the limits of the Colony,

and for such purpose to make and enter into any contract as may be requisite.

(c) To grant licences for the erection, construction, establishment or maintenance of instruments or apparatus for the purpose of transmitting or receiving messages within the Colony and across the seas by means of radiotelegraphy and for the transmission or reception of any such messages. Any licence granted under this Act shall be subject to such conditions and restrictions as the Governor in Council may prescribe.

(d) To make rules—

(i) For the proper and efficient working of any radiotelegraph station from time to time established under this Act;

(ii) Fixing the rates and charges for the transmission of messages thereby;

(iii) Regulating the conditions under which messages may be transmitted;

(iv) Prescribing the duties of the operator and probationers employed at any such station;

(v) For controlling the user of any instruments or apparatus erected, constructed, established or maintained under a licence granted under this act and the transmission or reception of any messages thereby;

(vi) For the training and examination of probationers;

(vii) For obtaining secrecy on the part of all persons employed in or in any way connected with the maintenance and working of any radiotelegraph station established under this Act and prescribing the form and nature of any oath of secrecy to be taken by any such persons; and

(viii) Generally for fully carrying into effect the objects of this Act.

(2) All radiotelegraph stations established under sub-sections (a) and (b) of sub-section (1) of this section shall be under the control of the Governor in Council.

4. It shall be lawful for the Governor, when in his opinion an emergency has arisen in which it is expedient for the public service that His Majesty should have control over the transmission and reception of messages to or from any radiotelegraph station in the Colony, to take possession of and assume control of any radiotelegraph station in the Colony to be used for His Majesty's service and subject thereto

for such ordinary service as may seem fit, or to direct and authorise such persons as he thinks fit to assume the control of the transmission and reception of messages either wholly or partly and in such manner as he directs.

5. (1) Whosoever shall unlawfully and maliciously cut, break, throw down, destroy, injure, remove or in any way interfere with any battery, machinery, wire, mast, post or other matter or thing whatsoever being part of, or being used or employed in or about any radiotelegraph station under this Act or in the working thereof shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for five years.

(2) Whosoever shall unlawfully or maliciously in any manner whatsoever prevent or obstruct the sending, conveying or delivery of any communication by radiotelegraphy under this Act shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for two years.

Provided that if it shall appear to any magistrate upon a preliminary inquiry into an offence against this section that it is not expedient to the ends of justice that any person charged with an offence against this section should be prosecuted in the Supreme Court, such magistrate may proceed summarily to hear and determine the charge and the offender shall on conviction thereof at the discretion of the magistrate, be liable to a penalty of £10 or to be imprisoned for one year.

6. Any person employed or engaged in any capacity whatsoever under this Act who shall, contrary to his duty, disclose or in any way make known or intercept the contents or any part of the contents of any message transmitted or received or to be transmitted or received to or at any radiotelegraph station under this Act shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for one year.

7. Whosoever shall unlawfully and maliciously by any overt act attempt to commit any of the offences mentioned in sections 5 and 6 of this Act shall on conviction thereof before a magistrate be liable, at the discretion of the magistrate, to a penalty of £5 or to be imprisoned for three months.

8. Any person who erects, constructs, establishes or maintains or commences to erect, construct, establish or maintain any instrument or apparatus for the purpose of transmitting or receiving or who transmits or receives messages within the Colony or across the seas by means of any radiotelegraphy whatsoever without having first obtained a licence so to do under this Act, shall be liable on summary conviction before a magistrate to a penalty of £200 or to be imprisoned for one year, anything in the Magistrates Act, 1896 to 1909, or any act passed in amendment thereof or in substitution therefor to the contrary notwithstanding.

9. Any radiotelegraph station established under this Act with funds granted by the Legislature and any apparatus, machinery, matter or thing used in connection therewith, is hereby declared to be the property of the Government of the Colony, and in all legal proceedings whatsoever instituted and taken in relation thereto the same may be laid and referred to as the property of the said Government.

10. The Acts set out in the Schedule to this Act are hereby repealed.

SCHEDULE.

Regnal Year and Chapter.	Short Title.
2 Ed. VII c. 22	The Wireless Telegraphy Restriction Act, 1902.
3 Ed. VII c. 17	The Wireless Telegraphy Restriction Amendment Act, 1903.

RULES

MADE BY THE GOVERNOR IN COUNCIL ON THE 3RD DAY OF NOVEMBER, 1913, UNDER THE AUTHORITY OF THE TELEGRAPH ACTS 1891 TO 1913.

B Paragraphs 1-14 inclusive refer solely to the wired telegraph system.

15. The radiotelegraph system shall be operated under the rules contained in the "Detailed Service Regulations" appended to the International Radiotelegraph Convention signed at London on the 5th day of July, 1912.

A copy of such "Detailed Service Regulations" shall be kept on file in the telegraph offices.

16. All apparatus for radiotelegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) The working of any radiotelegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

17. No apparatus for radiotelegraphy on board a merchant ship shall be worked or used whilst such ship is in the territorial waters of the Colony, except with the special or general permission in writing of the Governor.

18. Rules 16 and 17 shall not apply to the use of radiotelegraphy for the purpose of making or answering signals of distress.

19. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by radiotelegraphy the use of radiotelegraphy on board merchant ships whilst in the territorial waters of the Colony shall be subject to such further rules as may be made by the Governor in Council from time to time and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

20. The master of any merchant ship on board of which apparatus for radiotelegraphy shall be worked or used contrary to these Rules shall on summary conviction before a Magistrate be liable to pay a penalty of £200 and in default of payment to be imprisoned for a period of twelve months.

TARIFF OF CHARGES.

21. From New Providence to the American Coast ninepence-halfpenny a word, plus the

charges over the lines of other telegraph administrations, as published in the tariff book of the Western Union Telegraph Company, a copy of which shall be kept on file in the telegraph offices.

From New Providence to radio ship stations, threepence for each word, plus the rate charged by the ship station.

A "Deferred Message Service" at half the ordinary charge per word is in effect

between the Bahamas and certain other countries.

A list of such countries and a copy of the rules governing this class of message shall be kept on file in the telegraph offices.

Made by the Governor in Council this 3rd day of November, 1913.

By order,
W. H. HADDON-SMITH, Captain,
Clerk to the Executive Council.

BARBADOS

(See Map 45.)

ADMINISTRATION.

WIRELESS telegraphy in Barbados is worked under three Acts and one set of regulations, the Barbados Wireless Act of 1905, two Amending Acts, passed in 1913 and 1917, and a number of rules made under these latter Acts.

As these are quite distinct, we publish their respective texts below :—

A—Wireless Act, 1905 (confirmed 1908).

B—Wireless and Submarine Telegraph (Amendment) Act, 1913.

C—Wireless and Submarine Telegraph (Amendment) Act, 1917.

D—Rules made under the 1913 and 1917 Acts.

WIRELESS ACT, 1905 (CONFIRMED 1908).

A 1. This Act may be cited as the Wireless and Submarine Telegraph Act, 1905.

2. (1) The West India and Panama Telegraph Company shall not lay down or maintain a new telegraph cable nor shall any other company or person lay down or maintain any telegraph cable upon the foreshore and bed of the sea except under and in accordance with an Act of the Legislature.

(2) A person shall not establish any wireless telegraph station, or install or work any apparatus for wireless telegraphy in any place in this island except under and in accordance with an Act of the Legislature.

(3) If the West India and Panama Telegraph Company lays down or maintains a new telegraph cable or if any other company or person lays down or maintains any telegraph cable upon the foreshore or bed of the sea without the authority of an Act of the Legislature in that behalf, the company or person shall be liable, on conviction before a Police Magistrate, to a penalty not exceeding £100, and shall forthwith remove the telegraph cable, and if the telegraph cable be not removed within one day after such conviction the company or person shall be liable to a penalty not exceeding £50 for each day thereafter during which the company or person shall fail to remove the telegraph cable. Provided, that the Governor-in-Executive Committee may at any time after the expiration of one day from the date of the conviction cause the same to be removed and destroyed.

(4) If any person establishes a wireless telegraph station without the authority of an Act of the Legislature in that behalf, or installs or works any apparatus on any place in this island for wireless telegraphy without such authority in that behalf, he shall be liable, on conviction before a Police Magistrate, to a penalty not exceeding £100, and further be liable to forfeit any apparatus for wireless telegraphy installed or worked without such authority.

(5) If a Police Magistrate is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph

station has been established without legal authority in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place within his jurisdiction without such authority in that behalf, he may grant a search warrant to any police officer named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station or place and to seize any apparatus which appears to him to have been used, or intended to be used, for wireless telegraphy therein.

(6) No proceedings shall be taken under any of the provisions of this section except by order of the Governor.

WIRELESS ACT, 1913.

Passed on April 11th, 1913.

B 1. This Act may be cited as the Wireless and Submarine Telegraph (Amendment) Act, 1913 (1913-16).

2. (1) *Making of Rules and Regulations.*—The Governor-in-Executive Committee may from time to time make rules and regulations governing the use of wireless telegraph apparatus on merchant ships, British or foreign, while in the territorial waters of this Colony.

(2) *Ratification.*—Such rules and regulations when sanctioned by both Houses of the Legislature and assented to by the Governor, shall come immediately into operation and shall have the same force and effect as if the same had been herein expressly enacted.

(3) *Penalties.*—If the master of such ship or any person on board such ship commits a breach of any of these rules and regulations :

(a) The ship shall be subject to a maritime lien in favour of His Majesty the King, his heirs and successors, for a sum of one hundred pounds, and the amount so charged may be sued for and recovered in the Colonial Court of Admiralty ;

(b) The ship may be detained by force if necessary by the Harbour and Shipping Master or his chief clerk, with the aid of the harbour police, until payment of the lien aforesaid or until arrested under process of the Colonial Court of Admiralty ;

(c) The master of such ship shall be liable to a penalty not exceeding fifty pounds.

(d) The person committing the breach shall be liable to a penalty not exceeding fifty pounds.

3. (1) *Special Orders*.—In any case of urgency which is not provided for in the rules and regulations, the Governor may make any special order, and such order shall come immediately into operation and shall have the same force and effect as if the same had been herein expressly enacted.

(2) *Penalties*.—If the master of such ship or any person on board such ship commits a breach of any special order, the ship shall be subject to the maritime lien imposed by section 2 of this Act for the amount therein mentioned and may be detained as is therein provided, and the master, and the person committing the breach, shall be liable to a penalty not exceeding fifty pounds.

AN ACT

C To amend the Wireless and Submarine Telegraph Amendment Act, 1913. (1913-16.)

Be it enacted by the Governor, Council, and Assembly of this island, and by the authority of the same, as follows:—

1. This Act may be cited as the Wireless and Submarine Telegraph (Amendment) Act, 1917.

2. The Wireless and Submarine Telegraph (Amendment) Act, 1913, is hereby amended by inserting the words "and yachts" immediately after the words "merchant ships" in line three of subsection 1 of section 2 thereof, and the word "ship" wherever occurring in the subsequent parts of the Act shall be construed as including a yacht.

3. The Regulations made under the authority of the said Act by the Governor-in-Executive Committee on the thirty-first day of July nineteen hundred and thirteen, shall apply

to yachts as fully and in the same manner in all respects as they do to merchant ships.

RULES MADE BY THE GOVERNOR-IN-EXECUTIVE COMMITTEE UNDER SECTION 2 (1) OF ACT 1913-16, ON JULY 31ST, 1913, CONFIRMED AUGUST 11TH, 1914.

D 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with (a) Naval signalling or (b) the working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the Colony except with the special or general permission of the Colonial Secretary of the Colony.

3. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress

GRENADA.

ARRANGEMENTS are being made for the installation of a wireless station to connect with Barbados.

ADMINISTRATION.

Wireless telegraphy is regulated by the following Ordinances and regulations:—

A—Wireless Telegraph Ordinance.

B—Ordinance to amend the Wireless Telegraph Ordinance.

C—Ordinance to consolidate and amend the Law relating to Wireless Telegraphy.

D—Wireless Telegraph Ordinance, 1911 and 1913.

THE REVISED LAWS OF GRENADA. CHAPTER CXIII.

THE WIRELESS TELEGRAPH ORDINANCE

A AN ORDINANCE FOR THE MANAGEMENT BY THE GOVERNOR-IN-COUNCIL OF ALL INSTRUMENTS AND APPARATUS DESIGNED FOR THE TRANSMISSION OR RECEIPT WITHOUT THE INTERVENTION OF WIRE OR OTHER TANGIBLE CONNECTION, OF TELEGRAPHIC OR ELECTRIC MESSAGES, COMMONLY CALLED "WIRELESS TELEGRAMS," DECEMBER 15TH, 1903.

1. In this Ordinance—

The term "Wireless Telegraphy" means any system or installation, designed or constructed for the transmission or receipt of any messages or communications to or from a distant place by means of electric currents and signals generated by any apparatus or instrument which system, installation or instrument is unconnected by wire or other tangible attachment with such distant place;

The term "Wireless Telegram" means any message or communication transmitted,

or intended for transmission, by Wireless Telegraphy

2. The Governor-in-Council and the servants of the Government of the Colony shall have the exclusive privilege of installing, erecting, maintaining and using this Colony apparatus intended for Wireless Telegraphy, and also the incidental services of transmitting, receiving, collecting or delivering Wireless Telegrams.

3. It shall not be lawful for any person to instal, erect, maintain or use in this Colony any apparatus or instrument for the purpose of Wireless Telegraphy without having previously obtained from the Governor a licence in that behalf to be granted on such terms and conditions as the Governor may prescribe.

4. Any person contravening the provisions of this Ordinance shall be liable on conviction to a fine not exceeding Fifty Pounds, and the apparatus and installation in respect of which a conviction is obtained may by order of the Magistrate before whom such conviction is obtained be forfeited to the use of His Majesty the King.

5. All proceedings under this Ordinance may be taken before the Magistrate of the Southern District or any other person appointed by the Governor for the purpose of hearing and deciding the case; and the mode of procedure shall be according to the law in force for the time being in respect of other offences punishable on summary conviction.

6. This Ordinance may be cited as "The Wireless Telegraph Ordinance."

AN ORDINANCE TO AMEND THE WIRELESS TELEGRAPH ORDINANCE.

JANUARY 15TH, 1913.

B Be it enacted by the Governor with the advice and consent of the Legislative Council of Grenada as follows:—

1. The Governor-in-Council may make regulations—

(a) Prescribing the form and manner in which applications for licences under the principal Ordinance are to be made and the fees payable on the grant of any such licence;

(b) Governing the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in the territorial waters of the Colony; and

(c) Generally for the purpose of carrying the principal Ordinance into effect.

2. Any person committing a breach of any regulations made under this Ordinance shall be liable on summary conviction to a fine not exceeding Twenty Pounds.

3. (1) This Ordinance may be cited as the Wireless Telegraph Amendment Ordinance, 1913, and shall be read as one with the Wireless Telegraph Ordinance, and may be cited therewith as the Wireless Telegraph Ordinances, 1911 and 1913.

(2) The Wireless Telegraph Ordinance is herein referred to as the principal Ordinance.

Passed the Legislative Council this tenth day of January, in the year of our Lord one thousand nine hundred and thirteen.

C. LIVINGSTON WILSON,
Clerk of Councils.

I assent,

J. HAYES SADLER,
Governor.

January 15th, 1913.

AN ORDINANCE TO CONSOLIDATE AND AMEND THE LAW RELATING TO WIRELESS TELEGRAPHY. SEPTEMBER 1ST, 1923.

C Be it enacted by the Governor with the advice and consent of the Legislative Council of Grenada, as follows:—

Clauses 1 to 6 (2) are identical with those in the *Wireless Telegraph Ordinance No. 128, 1916 Revision*. Numbered therein 2 to 7 (2).

See under *St. Lucia*, p. 104.

7. The Wireless Telegraph Ordinance, and the Wireless Telegraph Amendment Ordinance, 1913, are hereby repealed.

8. This Ordinance may be cited as the Wireless Telegraph Ordinance, 1913.

SCHEDULE.

REGULATIONS.

See Schedule to Ordinance No. 128, 1916 Revision for *St. Lucia*, page

I assent. J. Hayes Sadler, Governor.
August 29th, 1923.

Passed the Legislative Council this fifteenth day of August, in the year of our Lord one thousand nine hundred and thirteen.

C. LIVINGSTON WILSON,
Clerk of Councils.

THE WIRELESS TELEGRAPH ORDINANCES, 1911 AND 1913.

REGULATIONS WITH RESPECT TO THE USE OF WIRELESS TELEGRAPH APPARATUS ON MERCHANT SHIPS.

(Gazetted February 1st, 1913.)

D Under the authority of section one of the Wireless Telegraph Ordinance, 1913, the following regulations are hereby made by the Governor-in-Council:—

1. In these regulations the expression "merchant ship" means any merchant ship, whether British or foreign.

2. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such a ship is in any of the harbours of the Colony except with the special or general permission of the Colonial Postmaster.

4. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made by the Governor-in-Council this 31st day of January, 1913.

C. LIVINGSTON WILSON,
Clerk of Councils.

JAMAICA**ADMINISTRATION.**

The laws and regulations under which radiotelegraphy is administered comprise the following:—

- A**—Telegraph Control Law, 1904.
- B**—Direct West India Cable Company's Law, 1909.
- C**—Regulations under Law of 1904.
- D**—Further Rules and Regulations.
- E**—Further Rules and Regulations (July, 1923).

**THE TELEGRAPH CONTROL LAW (7)
OF 1904.**

A 1. No person shall, within the Colony or any of its Dependencies, establish, maintain or use any telegraphic apparatus, mechanism, or contrivance, of what nature or kind soever the same may be, without due permission or licence under the hand of the Governor previously obtained for that purpose.

It is hereby expressly declared that what is commonly known as "wireless telegraphy," including the Marconi apparatus and any similar or other mechanism or contrivance whatsoever for the transmission of telegraphic messages without the employment of wires or cables, is a telegraphic apparatus, mechanism or contrivance within the meaning of this Section.

2. It shall be lawful for the Governor in Privy Council from time to time to make and as he shall see fit repeal, alter or vary rules and regulations for all or any of the following purposes, viz:—

Permitting or licensing any person to establish, maintain, or use any telegraphic apparatus mechanism, or contrivance, whether for the service of the public or for any private purpose;

Attaching conditions, restrictions, and limitations to the exercise of the privilege by such permission or licence conferred:

Providing suitable penalties and forfeitures for the contravention of the prohibition above contained in Section 1 of this law, and to the breach of any rule or regulation made thereunder, and providing for the recovery thereof, summarily or otherwise; provided that the penalty (over and above forfeitures) to be imposed for any one offence shall in no case exceed a fine of Two Hundred Pounds, or in default of payment thereof imprisonment, with or without hard labour, for a period not exceeding twelve months;

The exercise of all such powers and control over telegraphic establishments (by temporarily entering into possession thereof or otherwise) as may be necessary for the public safety, whether at all times, or in any case of emergency which may arise.

And generally for the better carrying out of the purposes of this law.

Such rules and regulations shall come into force as from the date of publication thereof in the *Jamaica Gazette*.

3. Nothing in this law contained shall invalidate or impair any legal right already possessed by any telegraph or cable company, relative to the laying down or landing of any telegraphic cable, the removal, renewal, maintenance, and use thereof, or any other like matter.

4. Law 1 of 1903 is hereby repealed.

LAW 21 OF 1909.

**THE DIRECT WEST INDIA CABLE
COMPANY'S LAW, 1909.**

B Whereas the Direct West India Cable Company, Limited, is desirous of establishing a wireless installation for communication between ships and the shore in Jamaica;

And whereas under the provisions of Law 7 of 1904, entitled "The Telegraph Control Law, 1904," no person shall establish, maintain or use within the Island of Jamaica, or any of its Dependencies, any apparatus or machine whereby communication by wireless telegraphy can be held between the said Island and ships, without having first obtained the sanction of and a licence from the Governor.

And whereas a licence to erect such a wireless station has been granted to the Direct West India Cable Company, Limited, by the Governor of Jamaica.

Be it enacted by the Governor and Legislative Council in Jamaica as follows:—

1. The protection, rights, powers, and facilities already granted to the Direct West India Cable Company, Limited, under Law 16 of 1898, entitled "The Direct West India Cable Company's Law, 1898," are granted and extended for the purposes of wireless telegraphy installation to be installed by the company or worked and maintained by them in so far as they may be applicable to the satisfactory and efficient working and maintenance of a wireless station or stations.

2. The Government of Jamaica shall acquire for the use and at the expense of the company a piece of land of sufficient dimensions at a place to be selected by the company and approved by the Government suitable and convenient for the economical erection, maintenance, and working of the installation, and when acquired such piece of land shall be conveyed to the company in fee simple, or if the Government of Jamaica possesses a piece of land of sufficient dimensions at a place approved by the company suitable and convenient for the economical erection, maintenance, and working of the installation and which the Government considers it desirable the company should have, the Government may sell the said piece of land at a price to be mutually agreed upon, or the Government may rent it to the company on such terms as may be agreed on during the period of the licence or for so long as the company may continue to work a wireless station or stations.

The acquisition of land by the Government of Jamaica under this section shall be deemed as an acquisition for public works within the meaning of the Public Lands Acquisition Law, 1897 (Law 31 of 1897).

REGULATIONS UNDER LAW OF 1914.

C It will be noted that under Clause 2 of the Telegraph Control Law (7), 1904, the Governor in Privy Council has the power of making rules and regulations, and a set of rules were accordingly promulgated during the year 1909, under which the working of wireless telegraphy is now being administered in Jamaica. These rules read as follows:—

1. Any licence granted under Law 7 of 1904 shall only entitle the licensee to establish, maintain and use that particular class of telegraph apparatus, mechanism, or contrivance mentioned in the licence. Every licence granted under the said law shall make mention of and fully describe the particular class of telegraphic apparatus, mechanism or contrivance which the applicant proposes to establish, maintain and use.

2. Every person establishing, maintaining or using any telegraphic apparatus, mechanism or contrivance in contravention of Section 1 of the Telegraph Control Law, 1904 (Law 7 of 1904), shall be liable to penalty not exceeding two hundred pounds, or, in default of payment, to be imprisoned with or without hard labour for a period not exceeding twelve months, and the telegraphic apparatus, mechanism or contrivance so established, maintained or used shall be liable to be forfeited to the Government of Jamaica.

3. Every person licensed under this law, who uses any telegraphic apparatus, mechanism or contrivance, for which he has not a licence shall be liable to the penalty and forfeiture mentioned in Rule 2 hereof, if the Resident Magistrate thinks fit to order such forfeiture.

4. Every person licensed under this law who acts contrary to the terms of this licence shall be liable to the penalty and forfeiture mentioned in Rule 2 hereof, if the Resident Magistrate thinks fit to order such forfeiture.

5. Proceedings for penalty and forfeiture under these rules shall not be taken except upon the authority of the Attorney-General.

6. Proceedings for the recovery of any penalty and for any forfeiture under these rules shall be of summary nature and shall be taken before the Resident Magistrate for Kingston.

FURTHER RULES.

D *Further Rules and Regulations made by the Acting Governor in Privy Council under the Telegraph Control Law, 1904, Law 7 of 1904.*

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of this colony shall be worked in such a way as not to interfere with (a) naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the colony except with the special or general permission in writing of the Governor.

3. These rules and regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

4. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of the wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules and regulations as may be made by the Governor from time to time, and such rules and regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. The master of any merchant ship on board of which apparatus for wireless telegraphy shall be worked or used contrary to these rules and regulations shall on summary conviction before a Resident Magistrate be liable to a penalty not exceeding two hundred pounds, and in default of payment to be imprisoned with or without hard labour for a period not exceeding twelve months.

FURTHER RULES AND REGULATIONS

E *Made by the Governor in Privy Council under the Telegraph Control Law, 1904 (Law 7 of 1904), and published in the "Jamaica Gazette" July 25th, 1923.*

ADDITIONAL RULES UNDER THE TELEGRAPH CONTROL LAW, 1904 (Law 7 of 1904).

1. Any applicant for a licence under the Telegraph Control Law, 1904 (Law 7 of 1904) shall produce evidence of his British nationality and two written references as to character. A certificate of birth should be furnished if possible; but this will not be insisted upon if the two referees testify of their own knowledge that the applicant is of British nationality. The Referees shall be persons of British birth and of standing, not related to the applicant.

2. In the case of the licensees holding a licence for experiments in wireless telegraphy or Wireless Telephony, there shall be no divulgence to any person (other than a duly authorised officer of the Government of Jamaica or a competent legal tribunal) or any use whatever be made of any message received by means of the apparatus, except messages in connection with his experiments received from another experimental station, time signals, musical performances and messages transmitted by any station for general information.

3. The installation shall be subject to the approval of the Electrical Inspector in this Island or any other person or officer duly authorised by the Governor in that behalf as also the location where such installation is to be made.

4. The station or installation shall not be used in such a manner as to cause interference with other stations or installations. Any oscillating valve or valve circuit employing magnetic or electrostatic reaction must not be coupled with the aerial or the aerial secondary circuit over the range of wavelengths between 300 and 500 metres. The use of separate heterodyne circuits coupled with the aerial or the aerial secondary circuits over the range of wavelengths between 300 and 500 metres is similarly restricted.

5. Applicants for licences for experiments in wireless telegraphy must satisfy the electrical inspector or other person or officer appointed by the Governor as aforesaid that they have in view some definite object of scientific value, or general public utility and that they are competent to carry out experiments in wireless reception and transmission. If scientific research be intended they must be certified as

competent investigators by a competent government officer authorised in that behalf or by some recognised scientific body.

6. All licensed apparatus shall be open to inspection at all reasonable times by the electrical inspector or other person or officer appointed by the Governor as aforesaid.

7. Each sending station shall be under the charge of a person who has satisfied the electrical inspector or other person or officer appointed by the governor as aforesaid by examination or otherwise, that he has attained :—

- (a) A sufficient knowledge of the adjustment and operation of the apparatus which he wishes to work.
- (b) A knowledge of the regulations of the International Convention in so far as they relate to the prevention of interference and impose certain duties on all wireless operators. Such regulations are published

and contained in the YEAR BOOK OF WIRELESS TELEGRAPHY AND TELEPHONY.

- (c) An operating speed of at least 12 words (Morse) a minute, sending and receiving.

A fee of five shillings will be charged for the examination referred to above, when necessary.

8. Authority to use wireless apparatus shall not be issued to a person under 21 years of age. Application should accordingly be made on his behalf by a parent or guardian who should proceed as above indicated and should, in addition, state his or her relationship to the minor. In such cases the evidence and references specified in Rule 1 of these Rules shall be furnished both in respect of the minor and of his parent or guardian.

9. A licence for experimental wireless apparatus will only be in force for a period of one year, but such licence may be renewed year by year and endorsed accordingly.

LEEWARD ISLANDS

ADMINISTRATION.

No wireless stations exist, but wireless telegraphy would be administered under :—

A—Ordinance No. 11, 1913.

B—Regulations made thereunder in 1913, and

C—Further Regulations dated 28th August, 1917.

D—Wireless Telegraphy Consolidating Ordinance 1913 (Dominica).

Similar legislation is in force in the other islands under the same administration.

ORDINANCE No. 11 OF 1913.

ANTIGUA,

A An Ordinance to consolidate and amend the law relating to wireless telegraphy.

Be it ordained by the Governor and Legislative Council of Antigua as follows :

1. This Ordinance may be cited for all purposes as "The Wireless Telegraphy Consolidation Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received; Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor-in-Council.

(2) Every such licence shall be in such form and for such period as the Governor-in-Council may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. No person shall work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Presidency, otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor-in-Council may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor-in-Council an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in territorial waters of the Presidency shall be subject to such further regulations as may be made by the Governor-in-Council from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place, or on board any merchant ship without a licence in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any licence granted under this ordinance, he may grant a search warrant to any police Officer or any person appointed in that behalf by the Chief Inspector of Police and named in the warrant, and a warrant so granted shall authorise the Police Officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person guilty of an offence against any provisions of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and

upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings under this Ordinance shall be taken on the complaint of the Chief Inspector of Police or of any person thereto authorised by him in writing.

8. Ordinance No. 12 of 1903 entitled "An Ordinance to regulate the establishment of Wireless Telegraphy" and Ordinance No. 7 of 1913 entitled "An Ordinance to amend the Wireless Telegraphy Ordinance, 1903," are hereby repealed.

Passed the Legislative Council the 14th day of October, 1913.

Dated at Antigua the 23rd day of October, 1913, in the fourth year of His Majesty's reign.

SCHEDULE—SECTION 5 (2).

REGULATIONS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Presidency shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Presidency or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Presidency except with the special or general permission of the Governor-in-Council.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

REGULATIONS.

MADE BY THE GOVERNOR-IN-COUNCIL.

C Whereas it is provided by section 5 (3) of the Wireless Telegraphy Consolidation Ordinance, 1913, that if at any time, in the opinion of the Governor-in-Council, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless

telegraphy on board merchant ships while in the territorial waters of the Presidency shall be subject to such further regulations as may be made by the Governor-in-Council from time to time; and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

And whereas in my opinion such emergency as aforesaid has arisen;

Now I do hereby rescind the further Regulations made under the said Ordinance on the 8th day of September, 1914, and make the following Regulations, namely:—

1. The radiotelegraph stations on board ships (other than ships requisitioned by His Majesty's Government) shall not be worked whilst such ships are within a harbour of the Presidency and for the proper enforcement of the above.

(a) Ships of British register in harbours of the Presidency must completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show that they are properly disconnected.

(b) Ships of foreign register in a harbour of the Presidency must, subject to the provisions of the following sub-sections (c) take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus.

(c) Ships of foreign register remaining in the harbour of the Presidency for less than twelve hours may at the discretion of the Governor be permitted to leave their aerials up, provided the same are disconnected in accordance with the provisions of sub-section (a) of this Regulation.

2. The Governor may at his discretion direct that the operating room of any ship (other than a ship requisitioned by His Majesty's Government) in a harbour of the Presidency be sealed or order any other steps to be taken affecting the radiotelegraph station on board any such ship.

3. Every person failing to obey and conform with the provisions of these Regulations or with any directions given by the Governor under the same shall be guilty of an offence and shall be liable on summary conviction to the penalties under the Ordinance provided.

Made by the Governor-in-Council, under section 5 (3) of the Wireless Telegraph Consolidation Ordinance, 1913, this 28th day of August, 1917.

THE WIRELESS TELEGRAPHY CONSOLIDATION ORDINANCE, 1913.

REGULATIONS MADE BY THE GOVERNOR-IN-COUNCIL.

D The Regulations made by the Governor-in-Council dated 2nd day of December, 1914, are hereby rescinded and the following substituted therefore:—

1. The radiotelegraphic apparatus on board ships shall not be worked whilst such ships are within the territorial waters of this Presidency, except as is hereinafter provided.

2. The Governor may appoint any persons to take possession and control of the apparatus for wireless telegraphy on board of any merchant ship while in the territorial waters of the Presidency.

Any person so appointed may enter upon any such ship and take possession of the aforesaid apparatus thereon on behalf of His Majesty and use the same for His Majesty's service

and subject thereto for such ordinary services as to the said person may seem fit.

4. For the proper enforcement of the above the person so appointed may—

(a) Require the master of any ship being within the territorial waters of the Presidency to completely disconnect the aerial wires from the radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected, or

(b) Take down the aerial wires completely and disconnect the same from the radio telegraphic apparatus.

(c) Seal up the radiotelegraphic cabin on

any ship, and the seal on such cabin shall not be broken without the consent of such person while the ship is within the territorial waters of the Presidency.

5. The master of any ship who shall refuse or fail to carry out any instructions given by a person appointed as aforesaid or shall obstruct any such person in the enforcement of these regulations, or shall break any seal shall be liable on summary conviction to the penalties under the Ordinance provided.

Made by the Governor-in-Council this 10th day of July, 1917.

R. B. SKINNER.

Acting Clerk of Council.

SAINT LUCIA (See Map 45).

CONTROL AND ORGANISATION.

THE wireless station situated on the Morné Fortuné was transferred to the local Government and opened for commercial work in August 1922.

ADMINISTRATION.

Wireless telegraphy is administered under an Ordinance No. 128, 1916 Revision and Regulations issued on its authority.

A—Wireless Telegraphy Ordinance, No. 128, 1916 Revision.

B—Regulations thereunder.

WIRELESS TELEGRAPHY ORDINANCE.

NO. 128, 1916 REVISION.

A This Ordinance may be cited as the Wireless Telegraphy Ordinance.

Clauses 2 to 7 (1) are identical with those in Ordinance No. 11, 1913, for the Leeward Island (see page 102) except that for the words "The Governor-in-Council" read "The Governor."

7. (2) Proceedings shall be taken before the First District Court on the complaint of the Chief of Police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

SCHEDULE.

REGULATIONS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof; and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

4. The Governor may appoint any person to take possession and control of the apparatus for wireless telegraphy on board of any merchant ship while in the territorial waters of the Colony.

5. Any person so appointed may enter upon any such ship and take possession of the aforesaid apparatus thereon on behalf of His Majesty, and use the same for His Majesty's Service, and subject thereto for such ordinary services as to the said person may seem fit.

6. Any such person may instead of taking possession of such apparatus as aforesaid direct the master of the ship to submit or cause to be submitted to him all messages intended for transmission or arriving by the said apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him, and generally to obey all such directions with reference to the transmission of messages as such person may prescribe, and the master of the ship shall obey and conform to all such directions. Any master failing to obey and conform to any such direction shall be liable on summary conviction to the penalties provided under the Ordinance.

7. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

8. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

9. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

ST. VINCENT

ADMINISTRATION.

NO wireless stations exist in this Colony, but wireless telegraphy would be administered under an Ordinance and Regulations which figure below.

A—Wireless Telegraphy Ordinance, 1913.

B—Regulations.

ORDINANCE.

A This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

Clauses 2 to 7 (1) are identical with those in the Wireless Telegraph Ordinance No. 11 of 1913 in force in the Leeward Islands (see page 102).

Clause 7 (2) reads:—

(2) Proceedings shall be taken before the Police Magistrate of the First District on the complaint of the Chief of Police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. "The Wireless Telegraph Ordinance 1904," and "The Wireless Telegraph Amendment Ordinance, 1912," are hereby repealed.

REGULATIONS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony, except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. Regulations made by the Governor in Council on the 17th day of December, 1912, under the authority of the Wireless Telegraphy Ordinance, 1904 and 1912, are hereby repealed.

TRINIDAD

THE Colony of Trinidad is administered by a Governor, assisted by an executive Council and Legislative Council.

CONTROL AND ORGANISATION.

The Trinidad and Tobago Government Wireless Service is a branch of the Public Works Department and under the control of the Director of Public Works.

ADMINISTRATION.

The Laws and Regulations governing radiotelegraphy are reprinted below:—

A—Ordinance No. 6 of 1917.

B—Regulations.

ORDINANCE No. 6 OF 1917.

ISSUED MAY 8TH, 1917.

A Be it enacted by the Governor of Trinidad and Tobago with the advice and consent of the Legislative Council thereof as follows:—

1. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1917.

2. (1) It shall not be lawful for any person to use or establish in this Colony any apparatus or installation for the purposes of wireless telegraphy, without first obtaining from the Governor a licence in that behalf, to be granted on such terms and conditions as the Governor may from time to time prescribe.

(2) Any person contravening the provision of this section is liable on summary conviction before a Magistrate to a fine not exceeding £50 or to imprisonment with or without hard labour, for any term not exceeding six months, and the apparatus and installation in respect of which a conviction is obtained may by order of the convicting magistrate be forfeited to the use of His Majesty the King.

3. (1) No person shall work any apparatus for wireless telegraphy installed on any merchant ship whilst this ship is in the territorial waters of the colony, otherwise than in accordance with regulations made in that behalf by the Governor in Executive Council.

(2) Such regulations shall be published in the *Royal Gazette*.

(3) Any person contravening, or permitting, procuring, or assisting in the contravention of, any such regulations is liable, on summary conviction before a magistrate, to a penalty not exceeding £50, or to imprisonment, with or without hard labour, for any term not exceeding six months.

4. Any person who unlawfully and maliciously:—

(a) Injures, removes or destroys any apparatus or installation for the purpose of wireless telegraphy, or any part of such apparatus or installation; or

(b) Obstructs or prevents in any manner whatsoever the sending, conveyance or delivery of any message or signal by wireless telegraphy;

is guilty of a misdemeanour and is liable to imprisonment, with or without hard labour, for any term not exceeding two years.

5. The Wireless Telegraph Ordinance (No. 236) and the Wireless Telegraphy Ordinance 1909 are hereby repealed.

Passed in Council this twenty-seventh day of April, in the year of Our Lord one thousand nine hundred and seventeen.

REGULATIONS MADE UNDER THE WIRELESS TELEGRAPHY ORDINANCE, 1917.

MERCHANT SHIPS IN TERRITORIAL WATERS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony should be worked in such a way as not to interfere with (a) Naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be worked so as not to interrupt, or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. Subject to the provisions of the preceding Regulation, ships at anchor in the harbours of

Port-of-Spain, San Fernando and Brighton may use their wireless apparatus for the purpose of sending and receiving messages to or from the Port-of-Spain Wireless Station, only in accordance with the following conditions:

(a) Messages will be accepted at the Port-of-Spain Wireless Station for transmission to ships at a special rate of two cents per word with a minimum of twelve words.

(b) Masters' service messages will be accepted at the Port-of-Spain Wireless Station from ships for delivery by telephone with confirmatory copy at the foregoing rates: Provided that the power radiated by such ships shall not exceed one quarter of an ampere on a 600 metre wavelength and that the radiated wave shall be sufficiently sharply tuned to avoid interference with stations working on any other wavelength.

(c) All charges made under this Regulation shall be payable at the Port-of-Spain Wireless Station.

3. No apparatus for wireless telegraphy on board a merchant ship at anchor in any harbour of the Colony shall be worked or used for the purpose of communicating with any other ship without the special or general permission of the Director of Public Works first had and obtained.

4. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the Public Service that His Majesty's Government or the Government of this Colony should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships whilst in the territorial waters of the Colony shall be subject to such further rules as may be made by the Governor in Executive Council.

5. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

6. The regulations made under the Wireless Telegraphy Ordinance, 1917, on June 12th, 1919, are hereby revoked.

Made by the Governor in Executive Council this 11th day of January, 1923.

J. M. FARFAN,

Acting Clerk of the Council.

CANADA

(See Maps 36 and 37)

Including: the Provinces of Alberta, British Columbia, Manitoba, New Brunswick, Nova Scotia, Ontario, Prince Edward Island, Quebec, Saskatchewan, Yukon and the North-West Territories.

THE executive power is vested in a Governor-General appointed by the Sovereign and aided by a Privy Council.

CONTROL.

The control of radiotelegraphy and telephony in Canada is vested in the Minister of the Department of Marine and Fisheries.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
The Hon. J. P. Arthur Cardin	Minister of Marine and Fisheries ..	Department of Marine and Fisheries, Ottawa.
Mr. A. Johnston ..	Deputy Minister of Marine and Fisheries	Department of Marine and Fisheries, Ottawa.
Lieut-Commander C. P. Edwards, O.B.E.	Director, Government Radio Service..	Department of Marine and Fisheries, Ottawa.
Mr. W. A. Rush ..	Division Superintendent, East Coast and Central Canada	Department of Marine and Fisheries, Ottawa.
Mr. E. J. Houghton ..	Division Superintendent, Pacific Coast	Old Post Office Building, Victoria, B.C.
Mr. A. N. Fraser ..	Headquarters Engineer	Department of Marine and Fisheries, Ottawa.
Mr. D. Manson ...	Chief Inspector	Department of Marine and Fisheries, Ottawa.
Mr. J. A. Holmes ..	Chief Traffic Officer	Department of Marine and Fisheries, Ottawa.
Mr. A. Sutherland ..	East Coast Radio Officer	Dockyard, Halifax, N.S.
Mr. L. W. Stephenson ..	District Engineer, Pacific Coast ..	Old Post Office Building, Victoria, B.C.
Mr. J. M. Colton ..	Inspector for Port of Montreal ..	6 Youville Place, Montreal, Quebec.
Mr. W. Howard ..	Inspector for Pacific Coast	Old Customs Building, Victoria, B.C.
Mr. S. J. Ellis ..	Inspector for Toronto	34 Adelaide Street East, Toronto, Ontario.

ORGANISATION.

According to the latest available information there are 34,525 radio-telegraph and telephone installations, classified as follows:—

Coast Stations	34
Licensed Limited Coast Stations	4
Licensed Ship Stations	244
Licensed Public Commercial Stations	8
Licensed Private Commercial Stations	52
Licensed Private Commercial Broadcasting Stations	40
Licensed Experimental Stations	40
Licensed Amateur Experimental Stations	331
Licensed Amateur Broadcasting Stations	15
Licensed Private Receiving Stations	33,727
Licensed Radiotelegraph Training Schools	11
Government Land Stations	1
Direction Finding Stations	7
Beacon Stations	6
Life Saving Stations	5

New stations providing additional aids to navigation were erected during the past year as follows:—

Direction Finding Stations at Pachena, B.C., Yarmouth, N.S., St. Paul Island, N.S.

Radio Beacons: Lurcher Lightship, Seal Island, N.S., Sambro Outer Bank (operated winter only), Cape Ray, Nfld., Cape Bauld, Nfld. Radio beacon apparatus has also been fitted in the Heath Point Lightship for operation upon request of ships fitted with D.F.

Life Saving Stations: Bamfield, B.C., Carmanah, B.C., Cape Beale B.C., Pachena, B.C.

These Life saving stations are fitted with radiotelephone equipment and provide for communication in case of emergency between the lighthouses and the life saving station in which the apparatus is fitted.

Continuous wave equipments have been installed in the existing stations at Gonzales Hill, Digby Island, Alert Bay and Estevan, B.C. These equipments are adapted for continuous wave or telephone work on various wave-

lengths and whilst primarily intended to be used for the rapid handling of point to point traffic are also available for communication with such ships as are fitted with continuous wave apparatus.

During the present year, it is proposed to replace the spark apparatus with continuous wave equipment in the stations at Quebec, Que., Montreal, Que., Toronto, Ont., and Point Grey, B.C., in order to reduce as far as possible interference with broadcast reception in the populous centres to which these stations are adjacent.

Amateur Experimental and Experimental Stations have been afforded additional privileges in the use of wavelengths and the following are now permitted :

Amateur Experimental Stations :

Pure c.w.	All waves in the band 125 to 150 metres, 175 metres.
	All waves in the band 200 to 225 metres.
Spark	175 metres only.
Radiophone and I.C.W.	Limited to the wavelengths of 150, 175 and 220 metres.

Experimental Stations :

Experimental Stations are allowed to transmit on all the above wavelengths and in addition on 275 metres for special experimental work.

A recent amendment to the Regulations provides for the increase of licence fees of Amateur Experimental Stations from \$1.00 to \$2.50, Amateur Broadcasting Stations from \$5.00 to \$10.00 and Ship Stations from \$1.00 to \$10.00.

ADMINISTRATION.

Previous to 1913, radiotelegraphy in the Dominion was regulated by Part 4 of the Telegraph Act. This is now replaced by the Radiotelegraph Act, assented to on the 6th June, 1913. A copy of the Radiotelegraph Act and Regulations issued thereunder, with all amendments to date, is attached hereto.

- A**—Radiotelegraph Act, 1913.
- B**—Radio Regulations (Revised to 1st June, 1923). Part I.
- C**—Radio Regulations Revised to 1st June, 1923). Part II.
- D**—Extract from Air Regulations, 1919.
- E**—Limited Coast Station Licence (W42).
- F**—Public Commercial Licence (W18).
- G**—Private Commercial Licence (W43).
- H**—Private Receiving Licence (W68).
- I**—Ship Licence (W19).
- J**—Training School Licence (W66).
- K**—Amateur Experimental Licence (W44).
- L**—Amateur Broadcasting Licence (W70).
- M**—Experimental Broadcasting Licence (W20).
- N**—Private Commercial Broadcasting Licence (W69).

3 & 4 GEORGE V., CHAP. 43.

AN ACT RESPECTING RADIOTELEGRAPHY STATUTES.

ASSENTED TO 6TH JUNE, 1913.

A His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows :—

1. This Act may be cited as the Radiotelegraph Act.

2. In this Act, unless the context otherwise requires—

(a) "Minister" means the Minister of the Naval Service (now Marine and Fisheries);

(b) "Radiotelegraph" includes any wireless system for conveying electric signals or messages including radiotelephones;

(c) "Coast station" means any radiotelegraph station which is established on land or on board a ship permanently moored and which is used for the exchange of messages and electric signals with ships at sea;

(d) "Land station" means any radiotelegraph station or installation of radiotelegraphic apparatus which is not a coast station or a ship station;

(e) "Ship station" means any radiotelegraph station established on board a ship which is not permanently moored.

3. No person shall establish any radiotelegraph station or install or work any radiotelegraph apparatus in any place in Canada or on board any ship registered in Canada except under and in accordance with a licence granted in that behalf by the Minister.

4. From and after the first day of January, nineteen hundred and fourteen, no passenger steamer, whether registered in Canada or not—

- (a) Licensed to carry fifty or more persons, including passengers and crew, and going on a voyage which is or which includes a voyage of more than two hundred nautical miles from one port or place to another port or place; or,
- (b) Licensed to carry two hundred and fifty or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than ninety nautical miles from one port or place to another port or place; or,
- (c) Licensed to carry five hundred or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than twenty nautical miles from one port or place to another port or place

shall leave or attempt to leave any Canadian port unless such steamer is equipped with an efficient radiotelegraph apparatus, in good working order, capable of transmitting and receiving messages over a distance of at least one hundred nautical miles by night and by day, and in charge of a person fully qualified to take charge of and operate such apparatus.

2. The owner, master or other person in charge of any passenger steamer which leaves or attempts to leave any Canadian port contrary to the provisions of this section shall, on summary conviction, be liable to a fine not exceeding one thousand dollars and costs, and such fine and costs shall constitute a lien upon such passenger steamer.

(3) This section shall not apply to passenger steamers plying on the rivers of Canada, including the River St. Lawrence as far seaward as a line drawn from Father Point to Point Orient, or on the Northumberland Straits, or on the Georgian Bay, or on the lakes of Canada other than Lakes Ontario, Erie, Huron and Superior, and the provisions of paragraph (c) of sub-section 1 of this section shall not apply to steamers making voyages on Lakes Ontario, Erie, Huron and Superior, the regular route for which is not at any point more than seven miles from the shore.

(4) This section shall not apply to steamers calling at Canadian ports solely for the purpose of obtaining bunker coal or provisions for the use of such steamer, or through stress of weather, or for repairs.

5. All persons operating land or cable telegraph lines shall transmit all messages destined to or coming from ship stations via coast stations under such rules as may be made by the Board of Railway Commissioners for Canada.

6. No one shall be employed as a radiotelegraph operator at any coast or land station unless he is a British subject, and all radiotelegraph operators on shore or land stations, or on ship stations on board any vessel registered in Canada, shall take and subscribe a Declaration of Secrecy in the form set forth in the Schedule to this Act, before a judge of any court, a notary public, a justice of the peace or a commissioner for taking affidavits, having authority or jurisdiction within the place where the oath is administered.

(2) Every person who has made the Declaration of Secrecy and who, either directly or indirectly, divulges to any person, except when lawfully authorised or directed so to do, any information which he acquired by virtue of his employment, is guilty of an offence and shall be liable on summary conviction to a penalty not exceeding one hundred dollars and to imprisonment for a term not exceeding six months.

7. Any person who sends or transmits or causes to be sent or transmitted any false or fraudulent distress signal, message, call or radiogram of any kind, or who without lawful excuse interferes with or obstructs any radio-communication, shall be guilty of an offence and shall be liable on summary conviction to a penalty not exceeding five hundred dollars and costs or six months imprisonment.

8. If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that a radiotelegraph station has been established without licence in that behalf, or that any apparatus for radiotelegraphy has been installed or worked in any place or on board any ship registered in Canada within his jurisdiction without a licence in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Minister and named in the warrant.

(2) A warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship and to seize any radiotelegraph apparatus which appears to him to be there used or intended to be there used for radiotelegraphy.

9. Every one who establishes a radiotelegraph station or installs or works any radiotelegraph apparatus in violation of the provisions of this Act, or of any regulation made hereunder, shall be liable on summary conviction to a penalty not exceeding fifty dollars, and on conviction on indictment to a fine not exceeding five hundred dollars and to imprisonment for a term not exceeding twelve months, and in either case shall be liable to forfeit to His Majesty, any radiotelegraph apparatus installed or worked without a licence.

(2) No proceedings shall be taken against any person under this section, except by order of the Minister.

10. The Governor in Council may—

(a) i. Prescribe the tariff of fees to be paid for licences and for examination for certificates of proficiency held and issued under the provisions of this Act;

ii. Authorize the payment of a portion of the licence fees collected in respect of certain prescribed licences to a provincial government, private company, or other prescribed party, and, notwithstanding anything to the contrary in any Act, to any Department or employee thereof, for services given in connection with the operation of broadcasting stations and for services performed for the Minister in connection with the licensing and inspection of stations.

(b) Accede to any international convention in connection with radiotelegraphy, and make such regulations as may be necessary to carry out and make effective the terms of such convention and prescribe penalties recoverable on summary conviction for the violation of such regulations; provided that such penalties shall not exceed five hundred dollars and costs;

- (c) Make regulations for the censorship and controlling of radiotelegraph signals and messages in case of actual or apprehended war, rebellion, riot or other emergency.

11. The Minister may make regulations—

- (a) Prescribing the form and manner in which applications for licences under this Act are to be made;
- (b) Classifying ship, coast and land stations and prescribing the type and range of the regular equipment and the emergency equipment to be installed in the several classes of stations;
- (c) Defining the different kinds of licences that may be issued, their respective forms and the several periods for which they shall continue in force;
- (d) Prescribing the conditions and restrictions to which the several licences shall respectively be subject;
- (e) Prescribing the different classes of certificate of proficiency and the class of certificate necessary to qualify persons as operators for the several classes of ship, coast and land stations;
- (f) For the examination of persons desiring to obtain certificates of proficiency as radiotelegraph operators and to determine the qualifications in respect of age, term of service, skill, character and other wise to be required for such certificates;
- (g) Prescribing the watches to be kept by operators and the number of operators to be maintained and kept at the different classes of ship, coast and land stations;
- (h) For the inspection of radiotelegraph stations;
- (i) To provide how radiotelegraph apparatus installed upon any foreign or British ship (whether such British ship is registered in Canada or elsewhere) shall be operated while such ship is within the territorial waters of Canada;
- (j) To compel all radiotelegraph stations to receive, accept, exchange and transmit signals and messages with such other radiotelegraph stations and in such manner as he may prescribe.
- (k) For the effective carrying out of the provisions of this Act.

(2) The Minister may, by regulation, authorise the imposition of a penalty not exceeding fifty dollars and costs or three months' imprisonment for the violation of any regulation made under this section, and any such penalty may be recovered upon summary conviction.

12. All regulations made under the provisions of the two sections immediately preceding shall be published in *The Canada Gazette*, and shall be laid before both Houses of Parliament within ten days after the publication thereof if Parliament is then sitting, and if Parliament is not then sitting, then within ten days after the next meeting thereof.

13. His Majesty may, at any time, assume, and for any length of time retain, possession of any radiograph station and of all things necessary to the sufficient working thereof, and may, for the same time, require the exclusive service of the operators and other persons employed in working the same; and the person owning or controlling the station shall give up possession thereof, and the operators and other persons so employed shall, during the time of such possession, diligently and faithfully obey such orders and transmit and receive such signals, calls and radiograms as they are required to receive and transmit by any duly authorised officer of the Government of Canada.

(2) If the Minister and the person owning or controlling any radiotelegraphic station taken possession of by the Crown under the provisions of this section cannot agree as to the compensation to be paid by the Crown for such taking possession, the Minister shall refer the matter to the Exchequer Court of Canada for adjudication.

14. Part IV of the Telegraphs Act is repealed.

SCHEDULE.

DECLARATION OF SECRECY.

I, A. B. solemnly and sincerely promise and declare that I will faithfully and honestly fulfil the duties which devolve upon me as radiotelegraphic operator, and that I will not, either directly or indirectly, divulge to any person, except when lawfully authorised or directed so to do, any information which I acquire by virtue of my employment as such operator, or which may come to my knowledge through the operation of any radiotelegraphic installation.

Declared before me at
this day of 19
[Signature of declarant.]

RADIO REGULATIONS.

Revised to 1st June, 1923.

PART I.

APPROVED BY THE GOVERNOR IN COUNCIL AND ISSUED IN ACCORDANCE WITH SECTION 10 OF THE RADIOTELEGRAPH ACT, CHAPTER 43, STATUTES 1913.

FEES FOR LICENCES.*

1. The annual fees to be paid in respect of licences issued by the Minister of Marine and Fisheries for the installation and operation of radiotelegraph stations in the Dominion of Canada, or on board any ship registered in Canada, shall be as follows:—

1. Limited Coast station	\$50.00
2. Public Commercial station	50.00
3. Private Commercial Broadcasting station	50.00
4. Private Commercial station	10.00
5. Experimental station	5.00
6. Amateur Broadcasting station	5.00
7. Amateur Experimental station	1.00
8. Private Receiving station	1.00
9. Technical or Training School station	5.00
10. Ship station	1.00

FEES FOR EXAMINATIONS.

2. The fees to be paid in respect of examinations for "Certificates of Proficiency in Radiotelegraphy and Radiotelephony" shall be as follows, for each examination or re-examination:—

1. Extra First-class certificate	\$5.00
2. First-class certificate	2.50
3. Second-class certificate	1.00
4. Third-class certificate	1.00
5. Experimental certificate	2.50
6. Amateur certificate .. .. .	.50
7. Emergency certificates, any class	5.00
8. Radiotelephone certificate	2.50

LONDON CONVENTION.

3. (i) The provisions of the International Radiotelegraph Convention of London, 1912, and of the regulations annexed thereto, shall be observed by all "coast stations" established in Canada, and by all "ship stations" on board any vessel registered in Canada.

(ii) *Penalty.*—Any person who installs or works any radiotelegraph apparatus at any of the above-mentioned stations in violation of this regulation, shall be liable on summary

*For amended fees see page 108.

conviction to a fine not exceeding five hundred dollars (\$500) and costs.

CONTROL OF STATIONS IN CASE OF EMERGENCY.

4. (i) *Coast and Land Stations.*—If, and whenever in the opinion of the Minister an emergency shall have arisen in which it is expedient for the public service that the Government shall have control over the transmission of messages by the apparatus of any coast or land station, it shall be lawful for the said Minister, by warrant under his hand, to direct and cause so much of the apparatus, as is within Canada or the territorial waters thereof, or any part of the apparatus, to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's Service and subject thereto for such ordinary services as to the said Minister may seem fit, and in that event, any person, authorised by the said Minister, may enter upon the stations, offices and works of any coast or land station or any of them and take possession thereof and use the same as aforesaid.

(ii) The Minister may, when he considers such an emergency as aforesaid to have arisen, instead of taking possession of such coast or land station, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the apparatus of such station, either wholly or partly and in such manner as he may direct, and such persons may enter upon the station premises accordingly, or the said Minister may direct the owner or his representative to submit to him or any person authorised by him all messages tendered for transmission or arriving by the apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said Minister may prescribe, and the owner or his representative shall obey and conform to all such directions.

(iii) The Minister may, when he considers such emergency as aforesaid to have arisen, close any coast or land station and cause the removal therefrom of the apparatus or any part thereof.

5. (i) *Ship Stations.*—If, and whenever, in the opinion of the Minister, an emergency shall have arisen in which it is expedient for the public Service that the Government shall have control over the transmission of messages by the apparatus of a radiotelegraph station on board any Canadian registered vessel, it shall be lawful for the said Minister, by warrant under his hand, to direct and cause the apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's Service and, subject thereto, for such ordinary services as to the said Minister may seem fit, and in that event any person authorised by the said Minister may enter upon any ship station and take possession thereof and use the same as aforesaid.

(ii) When the Minister considers such an emergency as aforesaid to have arisen, he may, instead of taking possession of such ship station, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the apparatus of such station, either wholly or partly, and in such manner as he may direct, and such persons may enter upon the station premises accordingly or the said Minister may direct the owner or his representative to submit to him or any person authorised by him all messages tendered for transmission or arriving by the apparatus

or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said Minister may prescribe, and the owner or his representative shall obey and conform to all such directions.

RADIO REGULATIONS.

Revised to 1st June, 1923.

PART II.

ISSUED BY THE MINISTER OF MARINE AND FISHERIES IN ACCORDANCE WITH SECTION II OF THE RADIOTELEGRAPH ACT, CHAPTER 43, STATUTES 1913.

LICENCES.

1. *Nationality of Licensees.*—Licences for "Transmitting stations" are issued only to British Subjects or to companies incorporated under the laws of the Dominion of Canada or any of the Provinces thereof.

Licences for "Private Receiving Stations" are issued to any person in Canada irrespective of nationality.

2. *Issue of Licences.*—Licences for "Private Receiving Stations" are issued by the Department of Marine and Fisheries, Ottawa, by Departmental Radio Inspectors, and by the Postmasters of the larger towns and cities in the Dominion of Canada.

Licences for all other classes of stations are issued by the Department of Marine and Fisheries, Ottawa, only.

Applications for Licences for other than "Private Receiving Stations" should be made on the form "Application for Licences" provided for that purpose, copies of which may be obtained directly from the Department or from any Departmental Radio Inspector.

2 (a) Applications for Licence to install and operate any of the following classes of stations for radiotelephony in the Province of Manitoba will, under arrangement between the Dominion and Provincial Governments, be submitted to the Minister of Telephones of the Province of Manitoba for endorsement before being finally dealt with by the Department of Marine and Fisheries:—

Public Commercial Station,
Private Commercial Station,
Private Commercial Broadcasting Station
Amateur Broadcasting Station.

3. *Classes of Licences.*—Licences for the following classes of stations may be issued:—

Coast Stations—

Limited Coast Station.

Land Stations—

Public Commercial Station,
Private Commercial Broadcasting Station,
Private Commercial Station,
Experimental Station,
Amateur Broadcasting Station,
Amateur Experimental Station,
Private Receiving Station,
Technical or Training School Station.

Ship Stations—

Ship Station.

4. *Duration of Licences.*—Licences will be valid for one year, commencing on April 1st and expiring on March 31st of the following year. All licences issued during the year automatically expire on March 31st, unless otherwise specified in the licence.

5. *Limited Coast Licences.*—Limited coast licences may be granted with respect to stations in localities not served by a regular Government coast station; such stations will be allowed

to undertake a limited correspondence with ships at sea determined by the object of such correspondence. They must exchange public messages with such ships, coast and land stations, as are designated in the licence, but with no other stations whatsoever.

For ship to shore working they must be operated in accordance with the provisions of the International Radiotelegraph Convention, and they must use such wavelengths as are specified in the licence.

The watches to be maintained and the number and class of operators to be carried are to be as specified in the licence, the regular form of which is annexed hereto (Form No. W. 42).

6. *Public Commercial Licences.*—Public commercial licences may be granted to land stations open for public correspondence with certain other land stations designated in the licence.

The wavelengths to be used, the watches to be maintained and the number and class of the operators to be carried are to be specified in the licence, the regular form of which is annexed hereto (Form No. W. 18).

Public commercial licences are also granted for receiving stations established for purposes of gain, such as receiving stations installed in theatres, halls, etc., for the purpose of giving radiotelephone concerts and for which an admission charge is made. The regular form of licence is annexed hereto (Form No. W. 18).

7. *Private Commercial Broadcasting Licences.*—Private commercial broadcasting licences may be granted to land stations to be operated for the broadcasting by radiotelegraph or radio telephone of news, information, entertainment or other service.

No tolls shall be levied or collected on account of any service performed by this class of station.

The working of the station must be strictly limited to the hours prescribed in the licence and the station must use such wavelength as is specified therein.

The station must be operated by a person who is the holder of a "First Class" or a "Radio telephone" Certificate of Proficiency in Radio.

The regular form of the private commercial broadcasting licence is annexed hereto (Form No. W. 69).

8. (i) *Private Commercial Licences.*—Private commercial licences may be granted to land stations to be operated in connection with the private correspondence of the licensee. Such stations will be limited to certain specific services which will be defined in the licence. Such stations shall not exchange messages with stations other than those specified in the licence, and except in the special case provided for in Section (ii) of this regulation, no tolls shall be levied or collected on account of any business transacted, or messages sent to or from the station. This class of station must use such wavelengths as are specified in the licence. The watches to be maintained and the number and class of operators to be carried shall be as specified in the licence, the regular form of which is annexed hereto (Form No. 43).

(ii) In the case of private commercial stations established at points not provided with any other means of rapid communication, such as telegraph or telephone, or in the case of interruption to such service, the Minister may prescribe that the licensed station must accept messages to and from the public, and communicate with such stations as may be designated. In this event, the licensee shall be entitled to collect a toll for the handling of such public correspondence, the amount of such toll to be as approved by the Board of Railway Commissioners and as specified in the licence.

(iii) The Minister at his discretion may authorise the licensed station to communicate with certain specified ship stations when such ship stations are within certain areas or localities to be specified in the licence. Messages handled with such ships must be limited exclusively to the business of the licensee and no coast station charge shall be levied in respect of such messages.

9. *Experimental Licences.*—Experimental licences will be granted to stations intended for purely experimental purposes and operated with a view to the advancement of the art of radio. Applicants for such licences must state their technical attainments and the general lines on which they propose to pursue their investigations. It should be observed that the fact that the applicant desires to conduct experiments with his equipment frequently does not justify or require a licence of this class, as most experiments can be conducted within the limitations of an "Amateur Experimental Licence" or by the use of an artificial aerial.

In addition to the provisions contained in the regular form of experimental licence annexed hereto (Form No. W. 20) the following special regulations will apply to all experimental stations.

SPECIAL REGULATIONS FOR EXPERIMENTAL STATIONS.

10. Applicants for an experimental licence must state in their application the wavelength or wavelengths they desire to use. The normal wavelengths for experimental stations are 175 metres spark and 275 metres C.W., and radiotelephone. In addition the licensee is authorised to use for special work such other wavelengths as are prescribed in the licence.

11. When transmitting on wavelengths of 275 metres or less the station must be worked by a person holding an "Amateur Experimental" or a higher grade of Certificate of Proficiency (see Regulation No. 97), and when transmitting on wavelengths greater than 275 metres it must, if it be within the range of any commercial or coast station, be worked by a person holding either a "First Class," "Second Class," or "Experimental" Certificate of Proficiency in Radiotelegraphy (see Regulations Nos. 93, 94 and 96).

12. The power used, measured at the terminals of the transformer, or generator, will normally be limited to $\frac{1}{2}$ kW.

In special cases, however, such as that of a commercial company desirous of testing and demonstrating apparatus, or of stations so far removed from any commercial station or route of navigation as to preclude any possibility of interference, the Minister may at his discretion permit the use of greater powers than $\frac{1}{2}$ kW.

13. The waves emitted must be as little damped as possible. In the case of spark stations the logarithmic decrement of a complete oscillation shall not exceed two-tenths and in the case of C.W. and radiotelephone stations the equivalent decrement shall not exceed that specified in the licence.

14. A distinctive call signal will be allotted to each station, commencing with the figure 9, e.g., 9AA, etc. This signal is to be transmitted twice at the termination of every transmission.

15. The regulations of the International Radiotelegraph Convention must, where applicable, be observed at the station.

16. The station, when operating, must listen for the signal "STP" which will indicate that an experimental station is interfering with commercial business.

The latter signal will only be made use of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STP" will, whenever possible, be preceded by the call signal allotted to the experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, experimental stations will absolutely cease to operate until the Government station gives the signal "Cancel STP."

17. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken.

18. When a licensed station is located near a commercial station it must be provided with a connection with the local telephone exchange so that prompt communication may be established in case of interference.

19. *Amateur Broadcasting Licences.*—Amateur Broadcasting Licences may be granted to recognised radio associations. They will not be granted to individuals. Such licences will permit broadcasting on a wavelength of 250 metres at the hours and for the periods prescribed in the licence.

The normal range of amateur broadcasting stations will be limited to 25 miles.

An association licensed to operate an amateur broadcasting station may, subject to the approval of the Minister, authorise a station belonging to one of its members to broadcast on its behalf, such station whilst broadcasting shall use the call signal and wavelength allotted to the association. The association will be held responsible for the proper operation of the station in accordance with the provisions of the licence and the radio regulations.

20. *Amateur Experimental Licences.*—Amateur experimental licences may be granted to small stations used for instruction, amusement or experimental purposes.

In addition to the provisions contained in the regular form of amateur experimental licence annexed hereto (Form No. W. 44), the following special regulations will apply to all amateur experimental stations:—

SPECIAL REGULATIONS FOR AMATEUR EXPERIMENTAL STATIONS.*

21. The normal transmitting wavelengths for amateur experimental stations are as follows:—
Spark, 175 metres.

Continuous wave and radiotelephone,
150, 175, 200 and 225 metres.

The power used, measured at the terminals of the transformer or generator, must not exceed $\frac{1}{2}$ kW.

22. Amateur experimental stations must be so operated as not to interfere with the working of any Government or commercial, coast, land or ship station. In the event of interference by an amateur experimental station the Department will limit the power and wavelength authorised for such station. In the event of continued interference by an amateur experimental station the department will cancel the licence issued for such station.

23. The station must be worked by a person holding an amateur experimental certificate of proficiency (see Regulation No. 97).

24. (a) The waves emitted must be as little damped as possible. In the case of spark stations the logarithmic decrement of a complete oscillation shall not exceed two-tenths and in the case of C.W. and radiotelephone stations the

equivalent decrement shall not exceed that specified in the licence.

(b) The use of plain aerial or other untuned highly damped spark transmitters is not allowed.

25. A distinctive call signal will be allotted to each station, commencing with a figure, e.g., 3AA, etc., which signal must be sent not less than three times at the termination of every transmission.

26. The regulations of the International Radiotelegraph Convention must, where applicable, be observed by the station.

27. Broadcasting by amateur experimental stations is not permitted (see Regulation 19 for Amateur Broadcasting Licence).

28. The station, when operating, must listen for the signal. On receipt of the "STP" signal, an amateur experimental station is interfering with commercial business.

The latter signal will only be made use of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STP" will, whenever possible, be preceded by the call signal allotted to the amateur experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, all amateur experimental stations will cease to operate until the Government station gives the signal "Cancel STP."

29. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken. At all other times, such as when the spark is being tested or sending is being practised, the aerial must be disconnected.

30. When the licensed station is in the vicinity of a commercial station it should be connected with the local telephone exchange so that instant communication may be established in case of interference.

31. *Private Receiving Licences.*—Private receiving licences will be granted for stations to be established for "reception only" and which are not used for the purpose of gain.

Receiving stations when using a receiver of the regenerative type for the reception of organised radiotelephone programmes must avoid increasing regeneration to the point at which the receiver begins to oscillate.

32. *Technical and Training School Licences.*—Technical and training school licences will be granted to stations intended for educational purposes; they will be afforded every facility for the work they propose to undertake compatible with any special local conditions such, as the existence of a Government or commercial station in their vicinity; in general they will be subject to the same conditions as experimental stations and amateur experimental stations.

The regular form of the licence is annexed hereto. (Form No. W. 66).

33. (a) *Ship Station Licences.*—Ship station licences will be granted to stations on British ships registered in Canada.

The regular form of the licence is annexed hereto. (Form No. W. 19.)

(b) The Minister may require as a condition to the issue of any Licence to be granted by him under the authority of this Act that the Licensee shall pay to the Minister, and maintain throughout the period during which licence or any renewal thereof is in force, a deposit of \$50.00 as security for the payment of coast station and landline delivery charges in respect of radio-

*For amended Schedule of permissible Wavelengths see page 108.

telegrams originating on board any vessel in respect of which the licence is issued and transmitted via any coast station, domestic or foreign, which deposit may be appropriated by direction of the Minister for the payment of any such charges which are not otherwise paid in due course and shall be returned at the expiry of nine months from the termination of the licence subject to such deductions as shall have been made for payment of any of the charges aforesaid.

CLASSIFICATION OF SHIP STATIONS.

Ship Stations will be classified as follows:—

34. *Class 1*.—All “sea-going” passenger vessels registered in Canada with an average speed of 15 knots or more, carrying 50 or more persons and plying between ports more than 200 miles apart; also all “sea-going” passenger vessels registered in Canada with an average speed of 13 knots or more, carrying 200 or more persons and plying between ports more than 500 miles apart.

35. *Class 2a*.—All “sea-going” passenger vessels registered in Canada affected by the provisions of Section 4 of the Radiotelegraph Act, which do not come under Class 1.

Class 2b.—All vessels registered in Canada plying on “coasting voyages” or on the “inland waters” of Canada which are affected by the provisions of Section 4 of the Radiotelegraph Act.

36. *Class 3*.—All vessels registered in Canada not affected by the provisions of Section 4 of the Radiotelegraph Act, but which have been voluntarily equipped with radiotelegraph apparatus.

The terms “sea-going,” “coasting voyage,” and “inland waters” are to be as defined in Section 72 of the Canada Shipping Act, Chapter 113, R.S. 1906.

REGULAR EQUIPMENT.

37. *Vessels in Class 1*.—The regular radiotelegraph equipment must have a minimum range of 100 nautical miles at all hours of the day and night with a similar equipment on a similar vessel and with all Canadian Government coast stations.

38. The normal wavelength of the emitted wave must be 600 metres; in addition the set must be capable of being operated on a wavelength of 300 metres, and means are to be provided whereby a quick change-over from one wavelength to the other may be effected.

39. In the case of small vessels on which it is materially impossible to use a transmitting wavelength of 600 metres, 300 metres may be employed; such ship stations, however, must be fitted with a receiver capable of tuning up to a 600 metre wavelength and the watches must be maintained on that wavelength.

40. The logarithmic decrement of a complete oscillation must not exceed two-tenths (0.2).

41. The power used by the transmitter, measured at the terminals of the generator of the station, must not, under normal circumstances, exceed 1 kw., except in the special case provided for in Article 35, paragraph 2, of the International Radiotelegraph Convention of London, 1912.

42. In the case of equipments using a power of more than 50 watts, an arrangement must be provided whereby several ranges, each less than the normal range, may be speedily obtained, the shortest range being, approximately, 15 nautical miles.

43. The use of “plain aerial” except in cases of distress or in installations using a power of less than 50 watts, is prohibited.

44. *Vessels in Class 2*.—Regulations No. 37 to No. 43, inclusive, shall apply to the equipments on vessels in Classes 2a and 2b.

45. *Vessels in Class 3*.—Regulations No. 38 to No. 43, inclusive, shall apply to equipments on vessels in Class 3.

EMERGENCY EQUIPMENTS.

46. *Class 1*.—Every vessel in Class 1 must carry an emergency source of power, instantly available, which shall be capable of operating the equipment for six hours, under normal conditions, with a minimum range of 80 nautical miles.

47. *Class 2*.—Vessels in Classes 2a and 2b must carry a similar source of power with the exception that the minimum normal range of the equipment is reduced to 50 nautical miles.

48. *Class 3*.—Vessels in Class 3 will not be required to carry emergency sets.

49. *Emergency Equipments Generally*.—(1) The emergency equipment in its entirety must in all cases be placed in the upper part of the ship, as high as practicably possible and in a position of the greatest safety.

(2) The emergency equipment may take the form of complete transmitter. Storage battery sets, of sufficient capacity to operate the regular radiotelegraph equipment of the vessel for the specified time, are, however, strongly recommended.

(3) A plain aerial transmitter may be installed as an emergency equipment, provided (subject to the provisions of Regulation No. 43) the use of the same is confined exclusively to distress calls.

(4) Regulations No. 46 to No. 49, inclusive, will become effective on and after December 1st, 1914.

50. *Spare Parts*.—Every ship station shall carry a reasonable number of spares of such parts of both the main and emergency radiotelegraph equipments as are subject to undue wear, deterioration, or liability to accident.

51. *Certificate of Inspection*.—The radiotelegraph installation on all British vessels registered in Canada will be subject to inspection by an officer of the Department of Marine and Fisheries at least once a year, who, if the apparatus is found to comply with the terms of the Radiotelegraph Act and the regulations issued thereunder, shall issue to the vessel a “Radiotelegraph Inspection Certificate” certifying that the equipment has been duly inspected and that it complies with the provisions of the licence issued therefor by the Minister of Marine and Fisheries, such certificate to be posted in the radiotelegraph cabin.

52. *Time*.—Radiotelegraph stations on vessels plying on the West Coast shall observe Pacific time, and those on the Great Lakes and East Coast Eastern Standard time.

WATCHES.

53. *Vessels in Class 1*.—A constant watch must be maintained at the radiotelegraph stations on all vessels in Class 1 (Regulation No. 34) whilst they are en route, and two operators, holding first-class certificates, must be carried on such vessels.

54. *Vessels in Class 2a*.—A constant watch from 8 a.m. to 3 p.m. and a watch during the first ten minutes of every other hour of the day must be maintained at the radiotelegraph

stations on all vessels in Class 2a (Regulation No. 35) whilst they are en route; the ten-minute watch may be maintained by an operator holding a "Second-class Certificate of Proficiency," or by a person holding a regular "Third-class Certificate."

55. *Vessels in Class 2b.*—Watches as herein-after specified in Regulations No. 57 to No. 67, must be maintained at the radiotelegraph stations on all vessels in Class 2b, whilst they are en route.

56. (1) *Vessels in Class 3.*—No fixed watches need be maintained at radiotelegraph stations on vessels in Class 3 (Regulations No. 36) when plying on a coasting voyage or on the Great Lakes on the runs specified in Regulations 57 to 62.

(2) *Vessels in Class 3 plying on transoceanic voyages, and carrying one operator, must keep watches as specified in Regulation 56a.*

56a. *Vessels carrying one operator, and plying on runs not covered by Sections 57 to 62, must whilst en route maintain watches as follows:*

See Schedule (A) *under Great Britain, Merchant Shipping (Wireless Telegraphy) Rules 1920 (Item I) page 226.*

PACIFIC COAST.

57. *Class 2b—Local Coasting Runs.*—Vessels in Class 2b, when plying on ferry or local runs between any ports in British Columbia south of Queen Charlotte Sound or between any ports in the above province north of that Sound and not steaming for more than 16 hours in any day, must, whilst en route, maintain watches during the following periods:—

7.30 a.m. to 8.00 a.m. and the last half-hour of every hour until 8.00 p.m.

9.30 p.m. to 10.00 p.m.

11.30 p.m. to 12.00 midnight.

3.30 a.m. to 4.00 a.m.

5.30 a.m. to 6.00 a.m.

In the case of vessels affected by Sub-section (c) of Section 4 of the Radiotelegraph Act (500 persons—ports more than 20 miles apart), the above watches need only be kept whilst the boats are en route between ports more than 20 miles apart.

58. *Vessels in Class 2b, when plying on ferry or local runs between any ports in British Columbia south of Queen Charlotte Sound or between any ports in the above province north of that Sound and steaming for more than 16 hours in any one day, must, whilst en route, maintain watches as prescribed in Regulation No. 57, with the exception that a watch may be maintained from 1.30 a.m. to 2.00 a.m. instead of from 3.30 a.m. to 4.00 a.m., and no watch need be kept between the hours of 2.00 a.m. 9.30 a.m.*

59. *Class 2b—Coasting Vessels Plying North and South.*—Vessels in Class 2b plying on runs between ports in British Columbia south of Queen Charlotte Sound and ports in the same province north of that Sound, or *vice versa*, must, whilst en route, maintain watches during the following periods:—

7.30 a.m. to 8.00 a.m.

10.30 a.m. to 11.00 a.m.

1.30 p.m. to 2.00 p.m.

4.30 p.m. to 5.00 p.m.

7.30 p.m. to 8.00 p.m.

10.30 p.m. to 11.00 p.m.

If, during these periods, the vessel is in the immediate vicinity of any place mentioned in the lists given in Regulations 60 and 61, communication must be established with the coast station shown, or should the vessel reach such vicinity out of the above periods the ship station must call such coast station until communication is established or it becomes out of range.

60. *North Bound:—*

Station.	LOCALITY.	
	Day Time. Between 7.30 a.m. and 11 p.m.	Night Time. Between 11 p.m. and 7.30 a.m.
Gonzales Hill	Trial Island	Trial Island
Point Grey /	The First Narrows or Abeam Porlier Pass	The First Narrows or Abeam Porlier Pass.
Cape Lazo	Abeam	Cape Mudge.
Alert Bay	Cape Mudge	Abeam.
"	Blinkensop Bay	Pine Island.
"	Abeam	Egg Island.
Triangle Island	Pine Island	Before reaching Harold Point.
"	Egg Island	Ivory Island.
"	Before reaching Harold Point	
"	Ivory Island	
Digby Island	Vancouver Rock	Watson Rock.
"	Watson Rock	Abeam.
"	Abeam	
"	Hodgson Island	Pointers.
"	Pointers	

61. *South Bound:—*

Station.	LOCALITY.	
	Day Time. Between 7.30 a.m. and 11 p.m.	Night Time. Between 11 p.m. and 7.30 a.m.
Digby Island	Pointers	Pointers.
"	Hodgson Island	
"	Abeam	Abeam.
"	"	"
Triangle Island	Lawyer Island	Lawyer Island.
"	Vancouver Rock	Vancouver Rock.
"	Ivory Island	
"	Harold Point	Harold Point.
"	Egg Island	Egg Island.
"	Pine Island	Pine Island.
Alert Bay	"	"
"	Abeam	
"	Blinkensop Bay	Blinkensop Bay.
Cape Lazo	Chatham Point	
"	Abeam	Abeam.
Point Grey	Sisters	Sisters.
"	Abeam	Abeam.
Gonzales Hill	Active Pass	Active Pass.

GREAT LAKES AND EAST COAST.

62. *Class 2b—Vessels Plying on the Great Lakes and on Coasting Voyages on the East Coast.*—Vessels in Class 2b plying on voyages of more than 300 miles between terminal ports on the Great Lakes or East Coast must maintain watches whilst en route as follows:—

7.00 a.m. to 7.30 a.m.

10.00 a.m. to 10.30 a.m.

1.00 p.m. to 1.30 p.m.

4.00 p.m. to 4.30 p.m.

7.00 p.m. to 7.30 p.m.

10.00 p.m. to 10.30 p.m.

Communication must also be established with each coast station when abeam, irrespective of whether such position is reached during the above periods or not.

63. Vessels in Class 2b, plying on voyages of less than 300 miles but more than 50 miles between terminal ports and not steaming for more than 16 hours out of the 24, must maintain watches whilst en route as follows:—

8.00 a.m. to 8.30 a.m. and the first half-hour of every hour until 8.30 p.m.

10.00 p.m. to 10.30 p.m.

12.00 p.m. to 12.30 a.m.

4.00 a.m. to 4.30 a.m.

6.00 a.m. to 6.30 a.m.

64. Vessels in Class 2b, plying on voyages of less than 300 miles but more than 50 miles between ports and steaming for more than 16 hours in any one day, must, whilst en route, maintain watches as prescribed in Regulation No. 63, with the exception that 2.00 a.m. to 2.30 a.m. is substituted for 4.00 a.m. to 4.30 a.m., and no watch need be kept between the hours of 2.30 a.m. and 10.00 a.m.

66. Vessels in Class 2b plying on voyages of less than 50 miles between terminal ports and not steaming more than 10 hours out of the 24 must, whilst en route, maintain a constant watch.

67. Vessels in Class 2b plying on voyages of less than 50 miles between terminal ports and steaming for more than 10 hours in the 24 must, whilst en route, maintain watches as prescribed in Regulation No. 64.

OPERATION.

68. *Power Available.*—Power for the operation of the main equipment shall be available during the periods a watch is being maintained under Regulations No. 53 to No. 67.

69. *Control of Ship Stations.*—The operation of the radiotelegraph station on any vessel shall be under the supreme control of the master of such vessel.

70. *Censorship by the Master of a Vessel.*—The master of a vessel shall have the right to censor all messages addressed to or transmitted by a radiotelegraph station on board his vessel, but such master shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal), or make any use whatever of any message coming to his knowledge through the exercise of such censorship, nor shall the master or any operator divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal), or make any use whatever of any message (other than a message of distress) coming to his knowledge and not intended for the said station.

71. *Form W. 40.*—A copy of Form W. 40 must be posted in every radiotelegraph station; these forms may be obtained from the Deputy Minister of the Naval Service on request.

72. *Secrecy of Messages.*—(a) No message shall be delivered, or its contents divulged, to any person except the addressee, his or her accredited agent, or such properly authorised persons as are essential for the forwarding of such message to its destination.

(b) Any person who makes any use of any message or the contents thereof which has been delivered or divulged to him or her in violation of Regulation No. 72 (a), shall be liable on summary conviction to the penalty prescribed for the violation of these regulations.

73. *Superfluous Signals.*—The transmission of superfluous signals by any ship or coast station is absolutely prohibited; trials and practices are forbidden except under such circumstances as to preclude the possibility of interference with other stations.

74. *Profane Language.*—No person shall transmit or make a signal containing profane words or language.

OPERATORS.

75. *Operators.*—The apparatus of all coast, land or ship stations, other than private receiving stations, must only be worked by persons holding regular Certificates of Proficiency in Radio, and who have subscribed to a Declaration of Secrecy, as prescribed in Section 6 of the Radiotelegraph Act.

76. *British Subjects.*—All operators on coast, ship or land stations must be British Subjects, and the different classes of stations must be worked by operators holding Canadian "Certificates of Proficiency" (subject to the provision of Section 77) not inferior to those hereinafter prescribed in Regulations No. 80 to 86, for the respective classes of stations.

77. *Ship Stations.*—The holders of Certificates of Proficiency in Radio issued in accordance with the provisions of the International Radiotelegraph Convention by His Majesty's Postmaster-General, the Administration of any British self-governing Dominion or Colony, or the Government of India, will (subject to the provisions of these regulations) be entitled to act as radio operators on any Canadian vessel so long as operators holding Canadian certificates are accorded similar privileges in respect of vessels belonging to such administrations.

78. *Certificates of Proficiency.*—The following Certificates of Proficiency in Radio are issued by the Department:—

Ship Stations—

- (1) First Class Certificate,
- (2) Second Class Certificate,
- (3) Third Class (Watcher's) Certificate,
- (4) Emergency Certificate,
- (5) Radiotelephone Certificate.

Land and Coast Stations—

- (6) Extra First Class Certificate,
- (7) First Class Certificate,
- (8) Second Class Certificate,
- (9) Third Class Certificate,
- (10) Emergency Certificate,
- (11) Radiotelephone Certificate,
- (12) Experimental Certificate,
- (13) Amateur Experimental Certificate.

79. *Emergency Certificates.*—In case of emergency in which it is impossible for an operator to attend a regular examination, the Minister may hold an emergency examination and shall have power to issue emergency certificates of any class. Such certificates shall not be valid for more than six months.

Any person holding an emergency certificate of proficiency must promptly apply for permission to attend an examination as provided by Regulation 87, and when notified of the date and place of examination he is hereby further required to attend a regular examination for a certificate of proficiency within the requirements of Regulations 89 to 97 inclusive, and the said emergency certificate shall expire and cease to be of effect on the day on which the result of such regular examination is published.

OPERATORS TO BE CARRIED:

80. *Ships in Class 1.*—Ships in Class 1 must carry two operators holding First-class Certificates.

81. *Ships in Class 2a.*—Ships in Class 2a must carry two operators, one First-class and one Second-class, or one First-class and one Third-class.

82. *Ships in Class 2b.*—Ships in Class 2b must carry one First-class operator.

83. *Ships in Class 3.*—Ships in Class 3, if they undertake public correspondence, must carry one First-class operator, or, if their service is limited exclusively to the ship's business, one Second-class operator.

84. *Coast Stations.*—(1) All public coast stations open for public correspondence and maintaining a constant watch must carry three operators, each of whom must hold a Canadian First-class Certificate of Proficiency. The Minister shall, however, have power in special cases to permit the employment of other persons on such stations for the purpose of maintaining the constant watch above mentioned, provided such persons are capable of transmitting and receiving in the Morse Code at a speed of twenty words a minute, as prescribed in Sub-sections (a) and (b) of Regulation No. 89 and provided the station is in charge of an operator holding a First-class Certificate of Proficiency.

(2) The regulation will become effective on and after the 1st of January, 1915.

85. All other coast stations shall carry such operators holding such certificates as are specified in the licence issued for the station under Regulation No. 4.

86. *Land Stations.*—Land stations (commercial, experimental, etc.) shall carry such operators holding such certificates as are specified in the licence issued for the station under Regulations Nos. 6, 7, 8, 9, 19, 20 or 32, according to the classification of the station.

EXAMINATION FOR RADIOTELEGRAPH CERTIFICATES OF PROFICIENCY.

87. *Applications.*—Applications for permission to attend examinations for any certificate of proficiency must be made to the Deputy Minister of the Naval Service on the special form provided for that purpose (W. 13). The date and place of examination will be notified to the candidate as soon as possible after receipt of the application.

PERSONS ELIGIBLE TO ATTEND EXAMINATIONS.

88. (a) No person shall be permitted to attend examination for any of the following classes of Certificates of Proficiency in Radio:—

Ship Stations—

- First Class Certificate,
- Second Class Certificate,
- Third Class (Watcher's) Certificate,
- Emergency Certificate,
- Radiotelephone Certificate.

Land and Coast Stations—

- Extra First Class Certificate,
- First Class Certificate,
- Second Class Certificate,
- Third Class (Watcher's) Certificate,
- Emergency Certificate,
- Radiotelephone Certificate,

- (i) Who is not a natural born British Subject;
- (ii) Who has at any time been of enemy nationality;
- (iii) Whose parents or either of them have at any time been of enemy nationality.

Provided, however, that any naturalised British Subject who has not or whose parents or either of them have not at any time been of enemy nationality may be admitted to examination if his application be approved by the Minister of the Department of Marine and Fisheries.

(b) Candidates for examination for first-class Certificates of Proficiency must not be less than eighteen years of age.

(c) For the purpose of this regulation a person shall be deemed to be of enemy nationality if he has at any time been the subject of a state with which Great Britain has been at war within the period of ten years immediately preceding the 15th day of October, A.D. 1919.

SHIP STATIONS.

89. *First-class Certificate.*—Candidates for first-class certificates will be examined in the following subjects:—

- (1) Transmission and reception at a speed of twenty words a minute;
- (2) Adjustment care and operation of apparatus;
- (3) The regulations applicable to the exchange of radiotelegraphic traffic.

The examination will consist of two sections "Practical" and "Written":—

"Practical" Section.

(a) To send on an ordinary radiotelegraph key for five consecutive minutes at not less than the prescribed speed (*viz.*, twenty words a minute, five letters being counted as one word); the accuracy of signalling, the correct formation of the letters, and the correctness of spacing will be taken into account.

(b) To receive and write legibly for no less than five consecutive minutes at the prescribed speed from signals received on a double headgear telephone receiver as ordinarily used for radiotelegraph reception.

(c) To connect up the apparatus with the help of a diagram of connections.

(d) To name the principal parts of the apparatus.

(e) To mention the most common faults which develop in the apparatus of the set in which he is being examined and the means usually taken to remedy them.

(f) To trace, locate, and remedy several such faults.

(g) To adjust the apparatus after it has been placed out of adjustment.

(h) To change the wavelength of the transmitter from 300 to 600 metres and *vice versa*.

(i) To reduce or increase the transmitting power.

"Written" Section.

(j) To complete a diagram of connections of the set in which the candidate is being examined.

(k) To answer seven technical questions on the equipment, including storage battery and emergency set, if any.

(l) To answer nine questions on the methods of handling radiotelegraph messages and the regulations applicable to the exchange of radiotelegraph traffic and communications as set out in the latest edition of the British Postmaster-General's Handbook and the service regulations annexed to the International Radiotelegraph Convention in force; the questions will also include the counting, checking and computation of tolls on three test messages. The candidate will also be required to have a thorough knowledge of the use of the "C.P.R.," "Western Union," and "C.N.T." tariff books and the "Official List of Radiotelegraph Stations"

* The Postmaster-General's "Handbook for Wireless Telegraph Operators" and the "International Radiotelegraph Convention of London" referred to in this section may be obtained from the Department of Marine and Fisheries, Ottawa, for the sum of 20 cents and 10 cents each, respectively, post free.

issued by the International Telegraph Bureau. Given these books, he will be required to compute the charges on a test message from any ship *via* any Canadian coast station to any telegraph office in the world.

90. *Second-class Certificate.*—Candidates for second-class certificates must pass a satisfactory examination on all the subjects prescribed for the first class, with the exception that the minimum speed of transmission and reception is reduced to twelve words a minute. Holders of this certificate will only be allowed to operate stations on ships in Classes 2a and 3, as specified in Regulations Nos. 81 and 83.

91. *Third-class Certificate.*—Third-class (Watcher's) certificate will authorise the holder to work at one station only, the name and call signal of which will be designated in the certificate.

The examination will be practical and *viva voce* and the candidate will be required:—

(1) To distinguish from other signals the call signal of the station designated in the certificate, when it is repeated several times, at the rate of ten words a minute;

(2) To distinguish from other signals the distress call "SOS" when it is repeated several times, at the rate of ten words a minute;

(3) To adjust the receiver for incoming signals on the wavelength normally used;

(4) To test the detector with a buzzer or other testing appliance and to adjust it for the efficient reception of signals on the normal wavelength.

COAST AND LAND STATIONS.

92. *Extra First-class Certificate.*—Candidates for Extra First-class Certificates, in addition to taking a thorough examination on the subjects set out in sections (c) to (l) of Regulation No. 89, will be required:—

"Practical" Section.

(a) To send and receive in the International Morse Code for five minutes at a speed of not less than twenty-five words a minute, under the conditions prescribed in sections (a) and (b) of Regulation No. 89;

(b) To trace, locate and remedy faults in standard radiotelegraph installations, of not less than five kilowatt power, including valve detector, gasoline engines, D.C. and induction motors and to adjust the same for efficient operation.

(c) The practical use of a wavemeter.

"Written" Section.

(d) To answer seven questions on the principles governing the working of radiotelegraph installations, internal combustion engines and dynamo electric machinery, as used in connection with radiotelegraph installations;

(e) To answer seven questions on the International Radiotelegraph Convention and regulations annexed thereto, the Regulations issued by the Minister of Marine and Fisheries and the procedure governing the obtaining of bearings from Direction Finding stations, the general organisation of a radiotelegraph service, including the procedure followed in connection with the transfer of business to and from land lines and the handling of radiotelegraph abstracts and accounts.

The holder of an extra first-class certificate will be authorised to operate on any Canadian coast, land or ship station.

93. *First-class Certificate.*—The examination for the first-class coast certificate will be similar in all respects to that for the first-class ship station certificate, with the exception that the candidate will be required to have a knowledge of the care and operation of gasoline engines.

94. *Second-class Certificate.*—The examination for the second-class coast certificate will be similar to that for the first class, with the exception that the minimum speed of transmission and reception is reduced to twelve words a minute.

95. *Third-class Certificate.*—The examination for the third-class coast certificate will be similar to that for the third-class ship certificate.

96. *Experimental Certificate.*—Candidates for an experimental certificate will be required:—

"Practical" Section.

(a) To send on an ordinary radiotelegraph key for five consecutive minutes at a speed of not less than twelve words a minute, five letters being counted as one word; the accuracy of signalling, the correct formation of the letters, and the correctness of spacing will be taken into account;

(b) To receive and write legibly for not less than five consecutive minutes at a speed of not less than twelve words a minute, five letters being counted as one word, from signals received on a double headgear telephone receiver as ordinarily used for radiotelegraphic reception, and to distinguish the signals "SOS," "STP," and his own call signal from among other signals, when sent at a speed of twenty words a minute;

(c) To reduce the transmitting power;

(d) To change the wavelength of the transmitter within the limits prescribed in the licence issued for the station;

(e) To adjust the apparatus after it has been placed out of adjustment.

"Written" Section.

(f) To complete a diagram of connections of the set in which the candidate is being examined;

(g) To answer seven technical questions on the equipment, including storage battery and emergency set, if any;

(h) To answer nine questions on the procedure governing the handling of radiotelegraph messages, and the regulations applicable to the exchange of radiotelegraph traffic and communications, particularly as set out in part 5, sections 60 to 91 of the Postmaster-General's Handbook for Wireless Telegraph Operators, section 6, articles 20 to 35 of the regulations annexed to the International Radiotelegraph Convention, and the Minister's Regulations applicable to the operation of experimental stations.

*97. *Amateur Experimental Certificate.*—Candidates for an amateur certificate will be examined in the adjustment and operation of the apparatus they propose to operate and will be required to have a satisfactory knowledge of the Departmental regulations governing the working of amateur experimental stations

*The Postmaster General's "Handbook for Wireless Telegraph Operators" and the "International Radiotelegraph Convention of London" referred to in this section, may be obtained from the Department of Marine and Fisheries, Ottawa, for the sum of 20 cents and 10 cents each, respectively, post free.

(Regulations Nos. 19 to 31), and those annexed to the International Radiotelegraph Convention of London, applicable to the working of stations generally, particularly section 6, articles 20 to 35, entitled "Transmission of Radiotelegrams."

The examination will be practical and *viva voce*, and the candidates will be required to send and receive in the International Morse Code at a speed of not less than ten words a minute and to distinguish from other signals the signals "SOS," "STP" and the call signal of his station, when repeated several times at a speed of ten words a minute.

EXAMINATIONS GENERALLY.

98. *Places at which examinations will be held.*—Examinations will generally be conducted at the Department of Marine and Fisheries, Ottawa; special arrangements will, however, be made where circumstances permit for holding an examination at any radiotelegraph station or any technical school of telegraphy at which suitable apparatus is provided for the purpose.

99. The certificates of proficiency will indicate the system or systems of radiotelegraphy under which the candidate's examination was conducted.

100. *Failure to Pass.*—In case of failure a candidate will not ordinarily be re-examined until after the lapse of three months. An additional fee will be payable in respect of the further examination.

101. *Suspension of Certificate.*—Should it be proved to the satisfaction of the Minister that the holder of a "Certificate of Proficiency" has wilfully or negligently failed to comply with the provisions of the International Radiotelegraph Convention and Regulations, or of these regulations, or of any other regulations which may be issued from time to time for his guidance, the certificate may, at the discretion of the Minister, be suspended or cancelled.

INSPECTION OF STATIONS.

102. *Inspection.*—Any duly authorised officer of the department may, from time to time, and at all reasonable times, enter upon any coast, land or ship station within the jurisdiction of Canada for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such station, also the working and uses of such apparatus and telegraphic instruments, and all books and papers used in connection with the operation of such station. His authority will be in the form of a letter signed by the Deputy Minister of the Department of Marine and Fisheries.

OPERATION OF SHIP STATIONS WITHIN THE TERRITORIAL WATERS OR HARBOURS OF CANADA.

103. *Ship Stations in Territorial Waters.*—The Radiotelegraph Stations on board ships (other than H.M. ships of war or Canadian Government vessels) shall not be worked while such ships are within the Territorial Waters of Canada, unless specific permission is granted therefor by the controlling Canadian coast stations for the locality, and then only provided such working does not interfere with the operation of any coast station established in Canada, and that the provisions of the Radiotelegraph Convention of London, 1912, and the Service Regulations annexed thereto are strictly observed.

104. *Ship Stations in Harbours.*—(a) The Radiotelegraph Stations on board ships (other than H.M. ships of war or Canadian Government vessels) shall not be worked whilst such ships are within a harbour of the Dominion of Canada, except as follows:—

(i) When direct communication by messenger, visual signals or other method between ship and shore is impracticable and then only for the purpose of exchanging with the nearest coast station messages relating exclusively to the business of the ship.

(ii) For the purpose of making or answering signals of distress.

(b) For the proper enforcement of the above, ships in Canadian harbours shall, if so instructed by a Canadian Government Radiotelegraph Inspector, or other properly authorised officer, completely disconnect the aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, in such a manner as to show they are properly disconnected.

105. *Penalty.*—Any person who violates any of the provisions of these regulations shall be liable on summary conviction to a penalty not exceeding fifty dollars and costs or three months' imprisonment.

EXTRACT FROM AIR REGULATIONS, 1919.

D 110. "No person shall install or work a radiotelegraph or telephone apparatus in any aircraft primarily registered in Canada, except in accordance with the terms of a licence granted by the Minister of the Naval Service, and no person shall work any radiotelegraph or telephone apparatus on any aircraft, except in accordance with the provisions of the International Radiotelegraph Convention and the Service Regulations annexed thereto."

W. 42.

LIMITED COAST STATION LICENCE

Licence No.

Call Signal.

E

DEPARTMENT OF MARINE AND FISHERIES.

DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations made thereunder.

The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate a radio coast station situated at

for the term of one year commencing on the first day of April, 19 and terminating on the thirty-first day of March, 19, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of fifty dollars (\$50), being the licence fee for the privilege above named.

This licence is subject to the Act and Regulations above referred to and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of

Marine and Fisheries for the time being, the term "Radio" means and includes "Radiotelegraph" and "Radiotelephone," and "International Radiotelegraph Convention" means the International Radiotelegraph Convention and Regulations annexed thereto specified in the schedule.

2. (i) The licensee shall not establish, install, or work any apparatus for radio, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii) The use of the licensed apparatus shall, except in cases of distress, be limited to the exchange of messages with such stations, vessels or lines of vessels as are specified in the schedule.

(iii) No tolls, fees, or other consideration shall be received, levied, or collected by the licensee until the same have been approved of by the Board of Railway Commissioners for Canada.

3. The licensee shall so work the licensed apparatus as not to interfere with the working of any radio station established in Canada or the territorial waters abutting on the coasts of Canada (whether on shore or on any ship), by or for the purposes of the Minister or any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radio stations established as aforesaid on land and radio stations established on ships at sea.

4. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister, from time to time, for the purpose of preventing interference with the working of any other radio station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

5. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

6. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

7. The licensee shall, if so required in writing by the Minister, cease to use the licensed apparatus for such period (not exceeding hours in any one day), as may be specified by the Minister.

8. Subject to the provisions of this licence the licensee shall transmit and receive messages by means of the licensed apparatus to and from any other station or to and from any ship without regard to the particular system of radio installed at such other station or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise.

9. (i) The licensee shall, subject to the priority classification prescribed by the International Radiotelegraph Convention, transmit all messages in the order in which they are received, provided if and whenever any Department of the Government shall require the licensee, his servants or agents, to transmit, by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other messages, and the licensee, his servants and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

10. The licensee shall, so far as possible, receive from all ships and light stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of form No. W. 40 issued by the Department of Marine and Fisheries.

12. A proces verbal of all signals transmitted, giving date, time and nature of such signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all proces verbaux for such period as is from time to time prescribed by the Minister and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

13. The licensee shall make a monthly return to the Minister of all the messages handled by the licensed apparatus and in addition shall render to the Minister such accounts as the Minister shall direct in respect of all charges due or payable under the International Radiotelegraph Convention, in respect of ship-and-coast messages and shall pay to the Minister, at such times and in such manner as the Minister shall direct, all sums which shall be due from the licensee under such accounts.

14. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

15. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraph or telephone line.

16. The licensee shall install the apparatus at the station mentioned in the schedule, and the said station shall be placed in operation within months from the date of this licence, and shall be kept in operation continuously during the hours specified in the schedule, until this licence shall expire.

17. All operators at the said station shall be British subjects, and must be of such number and the holders of such Certificates of Proficiency as are specified in the schedule annexed hereto.

18. The licensee shall observe at the said station the provisions of the "Radiotelegraph

Act" and those of the International Radiotelegraph Convention and the detailed regulations from time to time made under each or either of them for carrying such provisions into effect.

19. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents of any of the terms or conditions herein contained, and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become void.

20 (a). Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall, in his discretion, think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

21. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

22. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

23. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by registered post letter to the

office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Department of Marine and Fisheries, Ottawa.

SCHEDULE.

Special provisions applicable to the licensed station.

1. Name of station
2. Location
3. Latitude and longitude
4. Call signal
5. Normal range
6. System of radio
7. Type of aerial
8. Characteristics of transmitter
9. Characteristics of receiver
10. Decrement per complete period
11. Wavelength (normal underlined)
12. Source of power
13. Maximum power taken by transmitter
14. If A.C., number of cycles
15. Hours of service

16. Coast charge :—
Per word
Minimum per message
17. Operators to be carried on station :—
First class
Second class
Third class
18. Total charge (ship and coast to apply on outward messages only) :—
Per word
Minimum per message
19. Stations with which the licensed station may communicate

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this day of 19

W. 18.

PUBLIC COMMERCIAL LICENCE.

F 19.. Licence No. Call Signal
DEPARTMENT OF MARINE AND FISHERIES
DOMINION OF CANADA.
LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named
resident of
hereinafter called the licensee, is hereby
licensed to establish and operate a radio-
land station situated at

for the term of one year
commencing on the first day of April
and terminating on the thirty-first day of
March, and to install and operate
at such station the apparatus mentioned in
the schedule hereto, on payment of the sum
of Fifty Dollars (\$50), being the licence fee
for the privilege above-named.

This licence is subject to the said Act and
Regulations and to the following terms, con-
ditions and restrictions :—

1. In this licence, the following words and
expressions shall have the several meanings
hereinafter assigned to them unless there
be something, either in the subject or context,
repugnant to such construction, that is to
say :—

The term "Minister" means the Minister
or the Deputy Minister of the Department of
Marine and Fisheries for the time being, the
term "Radio" means and includes "Radio-
telegraph" and "Radiotelephone," and the
expression "Marine Signalling" means signalling
by means of any system of radio between two
or more ships, between ships and any coast station,
or between two Government coast stations.

2. The licensee shall not establish, install
work any apparatus for radio except the
apparatus hereinafter called "the licensed
apparatus," specified in the said schedule
hereto, nor shall wavelengths other than those
mentioned therein be employed.

3. The working of the licensed station shall
be limited to the exchange of messages
with such coast and land stations as are
specified in the schedule.

4. No tolls, fees, or other consideration
shall be received, levied, or collected by the
licensee until the same have been approved
of by the Board of Railway Commissioners
for Canada.

5. The licensee shall so work the licensed
apparatus as not to interfere with the working
of any radio station established in Canada

by any Department of His Majesty's Govern-
ment, or with the marine signalling on the
waters or territory of Canada or neigh-
bouring waters or territory.

6. The licensee shall comply with all such
directions and observe all such rules as may be
given or made by the Minister, from time to
time, for the purpose of preventing interference
with the working of any other radio station and
for enabling the messages exchanged by means
of the licensed apparatus to be distinguished
from those emanating from any other radio
station.

7. The licensee shall, if so required in writing
by the Minister, cease to use the licensed
apparatus for such period (not exceeding
hours in any one day) as may be
specified by the Minister.

8. The equivalent logarithmic decrement of
the emitted waves shall not exceed that pre-
scribed in the schedule.

9. The licensed apparatus shall not, without
the consent of the Minister, be altered or modified
in respect of any of the particulars mentioned
in the schedule hereto.

10. (i) The licensee shall transmit all messages
in the order in which they are received, provided
that if and whenever any Department of the
Government shall require the licensee, his
servants or agents, to transmit by means of
the licensed apparatus, any messages on His
Majesty's Service, such messages shall have
priority over all other messages, and the licensee,
his servants and agents, shall, as soon as reason-
ably may be, transmit the same, and shall, until
transmission thereof, suspend transmission of
all other messages.

(ii) The licensee shall not be entitled to
claim any compensation in respect of the
suspension of the transmission of messages
as aforesaid.

11. The licensee shall not divulge to any
person (other than properly authorised
officials of the Government or a competent
legal tribunal) or make any use whatever of
any message coming to the knowledge of the
licensee and not intended for receipt by means
of the licensed apparatus, nor shall he divulge
to any person other than the addressee or his
accredited agent the contents of any message
coming to his knowledge intended for receipt
by means of the licensed apparatus. The
licensee shall exhibit at the said station a copy
of Form No. W.40, issued by the Depart-
ment of Marine and Fisheries.

12. (i) A proces verbal of all signals trans-
mitted, giving date, time and nature of such
signals shall be kept by the licensee, also such
further particulars as the Minister shall from
time to time reasonably require. The licensee
shall preserve all proces verbaux for such
period as is from time to time prescribed by
the Minister, and such papers shall be open to
the inspection of the Minister or his officers
thereto authorised at the office of the licensee
in between the hours of 10 a.m.
and 5 p.m. on every day except Sunday or a
public holiday.

(ii) The licensee shall make a detailed
return of the messages handled by the
licensed station during each month on the
forms provided for that purpose, and shall
forward the same to the Minister at the
end of each month.

13. The Minister or his authorised officers
may, from time to time and at all reasonable
times, enter upon the herein licensed station,
for the purpose of inspection, and may inspect
any apparatus fixed or in use in such station,

for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being on such stations, and the working and user of such apparatus and telegraphic instruments.

14. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

15. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time, made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

16. The licensee shall install the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this licence, and shall be kept in operation during the hours specified in the schedule until this licence shall expire.

17. All operators and other employees of the licensee at the said station shall be British subjects, and must be of such number and the holders of such certificate of proficiency as are specified in the schedule annexed hereto.

18. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become void.

19 (a). Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall, in his discretion, think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

20. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

21. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries, and may be served by sending the same by registered post letter to the office of the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

Special provisions applicable to the licensed station.

SCHEDULE.

1. Name of station.....
2. Location.....
3. Call signal.....
4. Normal range :—
5. System of radio
6. Type of aerial.....
7. Characteristic of transmitter.....
8. Characteristics of receiver.....
9. Decrement per complete oscillation.....
10. Wavelengths.....
11. Source of power.....
12. Maximum power taken by transmitter..
13. If A.C., number of cycles.....
14. Hours of service.....
15. Charges :—
Per word.....
Minimum per message.....
16. Operators to be borne on station :.....
First class.....
Second class.....
Third class.....
17. Station with which the licensed station must communicate.

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this day of 19

W. 43.

PRIVATE COMMERCIAL LICENCE.

G 19 Licence No.
Call Signal.....
DEPARTMENT OF MARINE AND FISHERIES.
DOMINION OF CANADA.
LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named resident of herein after called the licensee, is hereby licensed to establish and operate a radio land station situated at for the term of one year commencing on the first day of April and terminating on the thirty-first day of March, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of ten dollars (\$10), being the licence fee for the privilege above-named.

This licence is subject to the said Act and regulations, and to the following terms, conditions, and restrictions :—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction that, is to say :—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radio-telegraph" and "radiotelephone," and the expression "Marine Signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to the exchange of messages with such coast and land stations as are specified in the schedule.

4. The station (except in special cases provided for in Sections (ii) and (iii) Radio Regulation, No. 8, shall be worked solely for the transmission and reception of messages appertaining to the service or affairs of the licensee and no tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any business or messages handled by the licensed apparatus.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any other Radio station in Canada, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by the licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radio station;

(b) With respect to any alteration of messages which the Minister may think necessary; and

(c) Generally with respect to avoiding interference between one radio station and another.

6. The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period or periods in each day as may be specified by the Minister.

7. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

8. (a) The licensed station must be provided with an accurate wavemeter of approved type;

(b) The licensed station must be provided with a connection with the local wire telephone system.

9. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

10. (i) The licensee shall transmit all messages in the order in which they are received, provided that if and whenever any Department of the Government shall require the licensee, his servants or agents, to transmit by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other messages and the licensee, his servants, and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

12. (i) A proces verbal of all messages and signals transmitted, giving date, time and nature of such messages and signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all proces verbaux for such period as is from time to time prescribed by the Minister, and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

(ii) The licensee shall make a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose, and shall forward the same to the Minister at the end of each month.

13. The Minister or his authorised officers may from time to time, and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

14. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

15. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

16. The licensee shall install the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this licence, and shall be kept in operation during the hours specified in the schedule until this licence shall expire.

17. All operators at the said station shall be British subjects and must be of such number and the holders of such certificate of proficiency as are specified in the schedule annexed hereto.

18. In case of any breach, non-observance, or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained, and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers

and authorities hereinbefore granted and thereupon these presents and the said licences, powers, and authorities, and each and every of them shall absolutely cease, determine and become void.

19. (a) Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain, and work any system or systems of radio-communication (whether of a like nature to that hereby licenced or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working and user of radio whether of a like nature to those hereby licenced or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

20. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licenced or permitted by these presents.

21. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

22. Any notice, request or consent (whether expressed in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

SCHEDULE.

1. Name of station
2. Location
3. Call signal.....
4. Normal range:—
Day
- Night.....
5. System of radio
6. Type of aerial.....
7. Characteristics of transmitter.....
8. Characteristics of receiver.....
9. Decrement per complete oscillation.....
10. Wavelength (normal underlined).....
11. Source of power.....
12. Rating of station Generator
13. Maximum power taken by transmitter and voltage.....
14. Hours of Service.....
15. Charges:—
Per word
- Minimum per message.....
16. Operators to be borne on station:—
First class.....
- Second-class.....
- Third class
17. Stations with which the licensed station must communicate.....

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this day of 19

W 68 (Est'd. May, 1922).

PRIVATE RECEIVING LICENCE.

H Radiotelegraph No.....
Branch Year 192....192....

LICENCE TO OPERATE A RADIO RECEIVING EQUIPMENT.

(Issued under the Radiotelegraph Act, Statutes, 1913, Chapter 43.)

.....
(Christian names in full) Surname).

is hereby licensed to operate a radio receiving equipment of

.....
(Street and number)

.....
(Province)

This licence shall be in force from the day of the date hereof, until 31st day of March next, unless sooner forfeited.

Received the sum of one dollar (\$1.00) licence fee this.....day of.....A.D. 192

A. JOHNSTON,
Deputy Minister, Department of
Marine and Fisheries.
Countersigned.....

ORIGINAL
To be handed
to Licensee.

SECRECY OF MESSAGES.

1. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

This does not apply to broadcasted concerts or programmes addressed to the General Public.

Regulation 105. Any person who violates any of the provisions of these regulations shall be liable on summary conviction to a penalty not exceeding fifty dollars and costs or three months' imprisonment.

NOTICE.

Irregular working and infractions of the radio regulations by transmitting stations should be immediately reported to the Director of Radio, Department Marine and Fisheries, Ottawa.

When using a receiver of the regenerative type for the reception of radiotelephone programmes, please avoid increasing regeneration to the point at which the receiver begins to oscillate. otherwise you will cause interference with neighbouring receiving equipments.

W. 19

SHIP LICENCE.

I 19... Licence No.
Call Signal

DEPARTMENT OF MARINE AND FISHERIES.
DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

Class Ship Station:

The herein named
resident of herein-
after called the licensee, is hereby licensed to establish and operate a radio station on board the vessel
for the term of one year commencing on the first day of April, nineteen hundred and

and terminating on the thirty-first day of March nineteen hundred and
and to install and operate at such stations the apparatus mentioned in the schedule hereto on payment of the sum of one dollar (\$1), being the licence fee for the privilege above named.*

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "Radio" means and includes "Radiotelegraph" and "Radiotelephone," and "International Radiotelegraph Convention" means the International Radiotelegraph Convention and Regulations annexed thereto specified in the schedule.

2. (i) The licensee shall not establish, install or operate any apparatus for radio, except the apparatus hereinafter called the "licensed apparatus," specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii) The ship station shall be of such class mentioned in Regulations Nos. 34, 35 or 36 of the Minister's Regulations, as is specified in the said schedule annexed hereto.

3. No tolls, fees or other consideration shall be received, levied or collected by the licensee until the same have been approved of by the Board of Railway Commissioners for Canada, and in no case shall they exceed the maximum fixed by the International Radiotelegraph Convention.

4. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister, from time to time, for the purpose of preventing interference with the working of any other radio station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

5. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

6. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule, except in cases of distress.

7. The licensee shall, so far as possible, receive from all ships and light stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

8. Subject to the provisions of this licence, and in accordance with the regulations issued from time to time by the Minister, the licensee shall transmit and receive messages by means of the licensed apparatus to and from any coast station or to and from any other ship station without regard to the particular system of radio installed at such coast station or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise, provided always that signals of distress and messages in connection therewith shall receive

priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

9. (i) The licensee shall, subject to the priority classification prescribed by the International Radiotelegraph Convention, transmit all messages in the order in which they are received, provided if and whenever any Department of the Government shall require the licensee, his servants or agents, to transmit, by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other messages, and the licensee, his servants and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

10. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any messages coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus, and the licensee shall exhibit at the said station a copy of Form No. W.40, issued by the Department of Marine and Fisheries.

11. A proces verbal of all signals transmitted giving date, time and nature of such signals shall be kept by the licensee also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all proces verbaux for such period as is from time to time prescribed by the Minister, and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

12. (i) The licensee shall make a monthly return to the Minister of all the messages handled by the licensed apparatus and in addition shall render to the Minister such accounts as the Minister shall direct in respect of all charges due or payable under the International Radiotelegraph Convention, in respect of ship-and-coast messages and shall pay to the Minister at such times and in such manner as the Minister shall direct all sums which shall be due from the licensee under such accounts.

(ii) The licensee shall if required pay to the Minister and maintain throughout the period during which this licence is in force a deposit of \$50 as security for the payment of coast station and landline delivery charges in respect of radiotelegrams originating at the licensed station and transmitted via any coast station, domestic or foreign, which deposit may be appropriated by direction of the Minister for the payment of any such charges which are not otherwise paid in due course and shall be returned at the expiry of nine months from the termination of the licence subject to such deductions as shall have been made for payment of any of the charges aforesaid.

13. The Minister or his duly authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed ship station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving

*The licence fee is now raised to \$10.

messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and use of such apparatus and telegraphic instruments.

14. The licensee shall observe at the said station the provisions of the Radiotelegraph Act and International Radiotelegraph Convention and detailed regulations from time to time made under each or either of them for carrying such provisions into effect.

15. (1) The licensed apparatus at the said ship station shall be worked only by a person or persons holding a certificate or certificates issued by the Minister, the British Postmaster-General or the corresponding authorities of any self-governing British colony or the Government of India, and the licensee shall provide for the working of the station such operators as are required by the provisions of Regulations Nos. 80, 81, 82 or 83 of the Minister's Regulations according to the classification of the station as specified in the schedule annexed hereto.

(ii) A certificate shall not be recognised as authorising the holder to work a ship station under the terms of this license unless it bears a statement that it is issued in accordance with the International Radiotelegraph Convention, specified in the schedule hereto.

16. The licensee shall carry on the ship on which the ship station is established under this licence a properly certified copy of such licence, and shall produce such copy for inspection if required so to do by the duly authorised officials of the countries where the ship calls, and the following documents:—

Radiotelegraph Act and Regulations issued thereunder;
International Radiotelegraph Convention and Regulations;
Postmaster-General's Handbook for Wireless Telegraph Operators;
Official list of Radiotelegraph Stations;
Official list of Call Signals;
C.P.R., G.N.W. or Western Union Tariff Book;

Adequate supply of telegraph forms; and also such other documents as may be prescribed by the Minister, for the purpose of enabling the licensee to communicate with coast and ship stations in accordance with the rules and regulations of the International Radiotelegraph Convention.

17. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and thereupon these presents, and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become void.

18. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of

radio, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

19. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

20. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

21. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa, Can.

SCHEDULE.

GENERAL.

1. International Radiotelegraphic Convention of
2. Name of Ship.....
3. Registered in
4. Owner
5. Classification
6. Apparatus operated by.....
7. Call signal.....
8. Nature of service.....
9. Watches to be maintained.....
10. Operators to be borne on station—
First class.....
Second class.....
Third class
11. Ship charge—
Per word
- Minimum per message

MAIN APPARATUS.

12. Normal range.....
13. System of radio
14. Type of aerial.....
15. Transmitting wavelength (normal underlined).....
16. Source of power.....
17. Maximum taken by transmitter.....
18. Decrement per complete oscillation.....
19. Characteristics of transmitter.....
20. Characteristics of receiver.....

EMERGENCY APPARATUS.

21. Normal range
22. Wavelength
23. Source of power and capacity of same....
24. Type of transmitter.....

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this day of 19

W. 66.

TRAINING SCHOOL LICENCE.

Licence No.
Call Signal.

J DEPARTMENT OF MARINE AND FISHERIES.

DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations made thereunder.

The herein named
resident of
hereinafter called the licensee, is hereby licensed

to establish and operate a radio Training School situated at _____ for the term of one year commencing on the first day of April, 19____, and terminating on the thirty-first day of March, 19____, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of five dollars (\$5), being the licence fee for the privilege above-named.

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "Radio" means and includes "Radiotelegraph" and "Radiotelephone," and the expression "Marine Signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. (i.) The licensee shall not establish, install or operate any apparatus for radio, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii.) The licensee shall work the licensed apparatus solely for the purpose of instruction in radio and for no other purpose whatever.

3. The licensee shall so work the licensed apparatus as not to interfere with the working of any radio station in Canada or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

4. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister, from time to time, for the purpose of preventing interference with the working of any other radio station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

5. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

6. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraph or telephone line.

7. The Minister or his officers, may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations and the working and user of such apparatus and telegraphic instruments respectively.

8. The licensed apparatus shall not, without the consent of the Minister be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

9. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any

International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

10. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. No person shall operate or work the receiving apparatus at the licensed school who has not subscribed to, and filed with, the Minister of Marine and Fisheries, a Declaration of Secrecy as prescribed in Section 6 of the Radiotelegraph Act, and Radiotelegraph Regulation No. 72. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

11. At least one of the instructors at the licensed school shall be the holder of a First-class Canadian Certificate of Proficiency in Radio. Other instructors, teaching in one or two subjects only, must have passed a successful examination in the subject or subjects, with which they propose to deal; the papers for this examination and the percentage of marks to be obtained will be as prescribed for the examination for a First-class Canadian Certificate of Proficiency in Radio.

12. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

13. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

14. (i) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(ii) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period as may be specified by the Minister.

15. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and thereupon these presents and the said licences, powers and authorities and each and every one of them shall absolutely cease, determine and become void.

16. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission

of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever, upon such terms as he shall, in his discretion, think fit.

17. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries Ottawa.

SCHEDULE.

1. Name of station
2. Location
3. Call signal
4. Type of aerial
5. Transmitting wavelength
6. Decrement per complete oscillation
7. Characteristics of transmitter
8. Characteristics of receiver
9. Source of power
10. Maximum power to be taken by transmitter
11. If A.C., number of cycles
12. Hours during which the station must not transmit
13. Stations with which the licensed station may communicate

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this day of 19

W. 44.
AMATEUR EXPERIMENTAL
LICENCE.

K

Licence No.
Call Signal.

DEPARTMENT OF MARINE AND FISHERIES.
DOMINION OF CANADA.
LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named
resident of
hereinafter called the licensee, is hereby licensed to establish and operate an amateur experimental radio station situated at for the term of one year commencing on the first day of April and terminating on the thirty-first day of March and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of one dollar (\$1.00) being the licence fee for the privilege above named.*

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radiotelegraph" and "radiotelephone," and the expression "marine signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

*The licence fee is now raised to \$2.50.

2. The licensee shall not establish, install or work any apparatus for radio except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. No tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any service performed by the licensed station.

4. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radio station in Canada, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licences:—

(a) With respect to all arrangements to be adopted for the purpose of sympathy or enabling signals transmitted by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

(b) Generally with respect of avoiding interference between one radio station and another.

5. (a) The licensee shall, if so required by the Minister, cease to use the licensed transmitting apparatus for such period or periods in each day as may be specified by the Minister.

(b) The licensed transmitting apparatus shall not be used during the periods when official time signals are being broadcasted.

6. The waves emitted must be as little damped as possible. In the case of spark stations the logarithmic decrement of a complete oscillation shall not exceed two-tenths and in the case of C.W. and radiotelephone stations the equivalent decrement shall not exceed that specified in the licence.

7. When the licensed station is in the vicinity of a Government or Commercial radio station it must be provided with a connection with the local wire telephone system.

8. The licensed apparatus shall not, without the consent of the Minister be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

9. The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelengths.

10. Broadcasting of any description by the licensed station is not allowed.

11. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

12. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

13. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to

time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

14. The licensed apparatus shall only be worked by a person, or persons, holding an Amateur Experimental Certificate of Proficiency in Radiotelegraphy as provided for in Regulation No. 97 of the Minister's Regulations.

15. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station for the purpose of inspection, and may inspect any apparatus fixed or in use in such stations for the purpose of sending and receiving messages, by radio or all other telegraphic instruments and apparatus fixed and being in such stations, and the working and user of such apparatus and telegraphic instruments.

16. (i) In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, or any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

(ii) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

17. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

18. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

19. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

SCHEDULE.

1. Name of Station.....
2. Location.....
3. Call Signal.....
4. Type of Aerial.....
5. Transmitting wavelength (1) Spark.....
(2) C.W. or Telephone.....
6. Decrement per complete oscillation.....
7. Characteristics of transmitter.....
8. Characteristics of receiver.....
9. Source of power.....

10. Maximum to be taken by transmitter....
11. If A.C., number of cycles.....
12. Hours during which the station must not transmit.....

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this.....day of.....19..

W. 70.

AMATEUR BROADCASTING LICENCE.

L Licence No.
Call Signal.

DEPARTMENT OF MARINE AND FISHERIES.
DOMINION OF CANADA.
LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations made thereunder.

The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate a radio land station at

for the term of one year commencing on the first day of April, - and terminating on the thirty-first day of March, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of five dollars (\$5.00), being the licence fee for the privilege above named.*

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radiotelegraph" and "radiotelephone," and the expression "marine signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to broadcasting.

4. No tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any service performed by the licensed station.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any other radio station in Canada, or with Marine signalling on the waters or territory of Canada, or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling signals transmitted by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

*The licence fee is now raised to \$10.

(b) With respect to any alteration of programmes which the Minister may think necessary and

(c) Generally with respect to avoiding interference between one radio station and another.

6. The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period or periods in each day as may be specified by the Minister.

7. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

8. (a) The licensed station must be provided with an accurate wavemeter of approved type;

(b) The licensed station must be provided with a connection with the local wire telephone system.

9. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

10. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40 issued by the Department of Marine and Fisheries.

11. A proces verbal of all signals transmitted, giving date, time and nature of such signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all proces verbaux for such period as is from time to time prescribed by the Minister, and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

12. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

13. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

14. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

15. The licensee shall install the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this licence and shall be kept in operation during the hours specified in the schedule until this licence shall expire.

16. All operators at the said station shall be British subjects, and must be of such number and the holders of such Certificate of Proficiency as are specified in the schedule annexed hereto.

17. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case the Minister may, by writing revoke and determine these presents and the licences, powers and authorities hereinbefore granted and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

18. (a) Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise), in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister from time to time, to enter into agreements of or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

19. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

20. The licensee may, subject to the approval of the Minister, authorise the use of a station belonging to one of its members to broadcast on its behalf. Such station whilst broadcasting becomes the licensed station authorised hereunder and the licensee will be responsible for its proper operation in accordance with the provisions of this licence.

21. (i) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(ii) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period (not exceeding eight hours in any one day) as may be specified by the Minister.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents may be under the hand of any authorised officer for the time being, of the Department of the Marine and Fisheries, and may be served by sending the same by registered post letter to the..... office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Department of Marine and Fisheries, Ottawa;

SCHEDULE.

1. Name of Station.....
 2. Location.....
 3. Call Signal.....
 4. Normal Range Day.....
Night.....
 5. System of Radio.....
 6. Type of Aerial.....
 7. Characteristics of Transmitter.....
 8. Characteristics of Receiver.....
 9. Decrement per complete oscillation.....
 10. Wavelengths (Normal underlined).....
 11. Source of power.....
 12. Rating of motor generator.....
 13. Maximum power to be taken by transmitter, and voltage.....
 14. Hours of service.....
 15. Operators to be borne on station:—
1st Class.....
2nd Class.....
3rd Class.....
- Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this.....day of.....19..

W. 20.

EXPERIMENTAL LICENCE.

Licence No.

Call Signal.

M

 DEPARTMENT OF MARINE AND FISHERIES.

DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named

resident of
hereinafter called the licensee, is hereby licensed to establish and operate an experimental radio station situated at for the term of one year commencing on the first day of April, and terminating on the thirty-first day of March, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of five dollars (\$5.00) being the licence fee for the privilege above named.

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radiotelegraph" and "radiotelephone," and the expression "marine signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The licensee shall work the licensed apparatus solely for the purpose of conducting experiments in radio, and for no other purpose whatever.

4. No tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any service performed by the licensed station.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radio station in Canada, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling signals transmitted by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

(b) Generally with respect of avoiding interference between one radio station and another.

6. The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period or periods in each day as may be specified by the Minister.

7. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

8. The licensed station must be provided with an accurate wavemeter of approved type.

9. The licensed station must be provided with a connection with the local wire telephone system.

10. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

11. The allotment of the wavelengths or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

12. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

13. When using a wavelength greater than 275 metres a proces verbal of all signals transmitted, giving date, time and nature of such signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all proces verbaux for such period as is from time to time prescribed by the Minister and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in

between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

14. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 46, issued by the Department of Marine and Fisheries.

15. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

16. The licensed apparatus shall only be worked by a person or persons holding such certificates as are specified in the schedule annexed hereto.

17. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations and the working and user of such apparatus and telegraphic instruments.

18. (1) In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

(2) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

19. Nothing in these presents contained shall prejudice or effect the right of the Minister, from time to time, to establish, extend, maintain, and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister from time to time, to enter into agreements of or to grant licences relative to the working or user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

20. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

21. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

1. Name of Station.....
2. Location.....
3. Call Signal.....
4. Normal range, Day.....
- Night.....

5. System of Radio.....
6. Type of Aerial.....
7. Characteristics of Transmitter.....
8. Characteristics of Receiver.....
9. Decrement per complete oscillation.....
10. Wavelengths (Normal underlined).....
11. Source of power.....
12. Rating of motor generator.....
13. Maximum power to be taken by transmitter and voltage.....
14. Hours during which station may transmit.....
15. The station must be worked by persons holding the following certificates:—
When transmitting on...metre wave..
When transmitting on...metre wave..
16. Stations with which the licensed station may communicate.....

Deputy Minister of Marine and Fisheries.

Department of Marine and Fisheries, Ottawa.

Dated this....day of.....19....

W. 69.

PRIVATE COMMERCIAL BROADCASTING LICENCE.

N

Licence No.

Call Signal.

DEPARTMENT OF MARINE AND FISHERIES.

DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statute 1913, and the Regulations made thereunder.

The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate a Radio land station situated at for the term of one year commencing on the first day of April, and terminating on the thirty-first day of March, , and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of Fifty dollars (\$50), being the licence fee for the privilege above named.

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radiotelegraph" and "radiotelephone," and the expression "marine signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to broadcasting.

4. The licensee shall not, without the consent of the Minister in writing, receive or collect any tolls, fees or other consideration on account of any service performed by the licensed station.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any other Radio station in Canada, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling signals transmitted by means of the licensed apparatus to be distinguished from those emanating from any other Radio station.

(b) With respect to any alteration of programmes which the Minister may think necessary, and

(c) Generally with respect to avoiding interference between one Radio station and another.

6. The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period or periods in each day as may be specified by the Minister.

7. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

8. (a) The licensed station must be provided with an accurate wavemeter of approved type;

(b) The licensed station must be provided with a connection with the local wire telephone system.

9. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

10. (i) If and whenever any department of the Government shall require the licensee, his servants or agents to transmit by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other transmissions and the licensee, his servants and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof suspend all other transmission.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal), or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

12. A procès verbal of all signals transmitted giving date, time and nature of such signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all procès verbaux for such period as is from time to time prescribed by the Minister, and such papers shall be open to the inspection of

the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

13. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

14. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

15. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

16. The licensee shall install the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this licence, and shall be kept in operation during the hours specified in the schedule until this licence shall expire.

17. All operators at the said station shall be British subjects, and must be of such number and the holders of such Certificate of Proficiency as are specified in the schedule annexed hereto.

18. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licence to be observed and performed then in any such case the Minister may, by writing revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

19. (a) Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister from time to time, to enter into agreements of or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

20. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

21. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Department of Marine and Fisheries, Ottawa.

SCHEDULE.

1. Name of Station
2. Location
3. Call Signal
4. Normal Range, Day
- Night.....

5. System of Radio
6. Type of Aerial
7. Characteristics of Transmitter
8. Characteristics of Receiver
9. Decrement per complete oscillation.....
10. Wavelengths (normal underlined).....
11. Source of power.....
12. Rating of motor generator
13. Maximum power to be taken by transmitter, and voltage
14. Hours of Service
15. Operators to be borne on station :—
1st Class.....
2nd Class.....
3rd Class.....

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this.....day of.....19..

CEYLON.

(See Maps 17 and 18)

Including : Maldie Islands.

THE Island is administered by a Governor aided by an Executive Council.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. E. Harper, M.I.E.E.,... Mem. Inst. Radio Engrs.	Chief Engineer	Colombo.
Mr. A. G. Tillekeratne ..	Superintendent of Traffic	Colombo.

International time signals and weather reports are broadcast daily at 5 G.M.T. and 17 G.M.T. on a wavelength of 600 metres spark, and at 6 G.M.T. and 18 G.M.T. on a wavelength of 2,300 metres C.W.

For experimental purposes the broadcasting of music and other items of general interest from the Colombo station has been sanctioned by Government.

An amateur organisation, "The Ceylon Radio Society," has been formed for the development of local study.

ADMINISTRATION.

Wireless telegraphy in Ceylon is regulated (a) by such clauses of the 1908 Ordinance as are applicable to wireless telegraphy ; (b) by the amending Ordinances No. 15 of 1914, and No. 10 of 1923 ; and (c) by the rules formulated under the provision of the latter Ordinance.

A—Ordinance No. 15 of 1914 (August 18th).

B—Ordinance No. 10 of 1923 for further amendments to the Ceylon Telegraph Ordinance, 1908 (May 14th).

C—Rules under this Ordinance (January 31st, 1924).

ORDINANCE.

A Ordinance No. 15 of 1914 (modifying Ordinance No. 35 of 1908) and dated August 3rd, 1914, provides in its Clause 5 an amendment of Section 7 of the 1908 Ordinance. This prescribes the right of the Governor in Executive Council to "make rules, consistent with the Ordinance, for the conduct of all or any telegraphs established, maintained, or worked by the Government or by persons licensed under this Ordinance." Rules under this section may provide for all or any of the following, amongst other matters, that is to say :—

(a) The rates at which, and the other conditions and restrictions subject to which messages shall be transmitted.

(b) The precautions to be taken for preventing the improper interception or disclosure of messages.

(c) The period for which, and the conditions subject to which, telegrams and other documents belonging to, or being in the custody of, telegraph officers shall be preserved ; and

(d) The fees to be charged for searching for telegrams and other documents in the custody of any telegraph officer.

(e) For prescribing the form and the manner in which applications for licences under this Ordinance are to be made.

(f) For prescribing fees payable on the grant of any licence.

(g) For regulating the manner in which an apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of Ceylon, shall be worked so as to prevent interference with naval signalling, or the working of any wireless telegraph or telephone station lawfully established, installed, or worked in Ceylon or the waters thereof, and so as not to interrupt or interfere with the transmission of any messages between wireless telegraph or telephone stations established as aforesaid on land and wireless telegraph or telephone stations established on ships at sea.

(h) For prohibiting, except with the special or general permission of the Postmaster-General of Ceylon, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, while such ship is in any of the harbours of Ceylon.

(i) For prohibiting or regulating, in case at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of Ceylon, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may deem fit to make from time to time, either in all cases, or in such cases as may be deemed desirable.

Moreover, Clause 6 of Ordinance No. 15 of 1914 adds to Clause 7 of the 1908 Ordinance a new sub-section lettered (2) A, which runs as follows:—

Provided that no regulations made in respect of the matters described in paragraphs (g), (h), and (i) or sub-section (2) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

AN ORDINANCE FURTHER TO AMEND "THE CEYLON TELEGRAPH ORDINANCE, 1908."

B Whereas it is expedient further to amend "The Ceylon Telegraph Ordinance, 1908": Be it therefore enacted by the Governor of Ceylon, by and with the advice and consent of the Legislative Council thereof, as follows:

This Ordinance may be cited as "The Ceylon Telegraph (Amendment) Ordinance No. 10 of 1923."

2. Section 4 of the principal Ordinance as the same is set forth in section 4 of Ordinance No. 15 of 1914 is hereby repealed, and there shall be substituted therefor the following section:

4. (1) No person shall install, establish, maintain, or work any telegraph in any place or on board any aircraft in Ceylon, or on board any British ship registered in Ceylon, or import or sell any apparatus for wireless telegraphy, except under and in accordance with a licence granted in that behalf by the Governor as hereinafter provided.

Provided that nothing in this section shall preclude any person from establishing telephonic communication by wire between separate portions of any ship or aircraft or of any building, or between any two or more buildings within the limits of any property belonging to the same owner.

(2) The Governor, whenever he shall deem it expedient to do so, may grant to any person a licence to install, establish, maintain, or work any telegraph in any place or on board any aircraft in Ceylon or on board any British ship registered in Ceylon, or to import or sell any apparatus for wireless telegraphy.

(3) Every such licence shall be in such form, and for such period, and in consideration of such payments as the Governor, with the advice of the Executive Council, may determine, and shall contain such terms, conditions, and restrictions on and subject to which the licence is granted as the Governor shall consider desirable in the public interest.

3. Section 7 of the principal Ordinance, as the same is amended by sections 5 and 6, Ordinance No. 15 of 1914, is hereby repealed, and there shall be substituted therefor the following section:

7. (1) The Governor in Executive Council may from time to time by notification in the *Government Gazette*, make rules consistent with this Ordinance for the conduct of all or any telegraphs established, maintained, or worked by the Government or by persons licensed under this Ordinance.

(2) Rules under this section may provide for all or any of the following among other matters, that is to say:

(a) The rates at which, and the other conditions and restrictions subject to which, messages shall be transmitted;

(b) The precautions to be taken for preventing the improper interception or disclosure of messages;

(c) The period for which, and the conditions subject to which, telegrams and other documents belonging to, or being in the custody of, telegraph officers shall be preserved;

(d) The fees to be charged for searching for telegrams and other documents in the custody of any telegraph officer;

(e) For prescribing the duration of licences and the form and the manner in which applications for licences under this Ordinance are to be made;

(f) For prescribing fees payable on the grant or renewal of any licence;

(g) For regulating the manner in which an apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of Ceylon, or aircraft while in or over the Island of Ceylon or the territorial waters thereof, shall be worked so as to prevent interference with naval signalling, or the working of any wireless telegraph or telephone station lawfully established, installed, or worked in Ceylon or the waters thereof, and so as not to interrupt or interfere with the transmission of any messages between wireless telegraph or telephone stations established as aforesaid on land and wireless telegraph or telephone stations established on ships at sea, or on aircraft;

(h) For prescribing terms and conditions subject to which licences may be granted for the installation or establishment of any telegraphs;

- (i) For regulating and controlling such telegraphs and the use thereof;
 - (j) For prohibiting, except with the special or general permission of the Postmaster-General of Ceylon, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, while such ship is in any of the harbours of Ceylon, or, in the case of aircraft, when such craft is not in flight; and
 - (k) For prohibiting or regulating, in case at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of Ceylon, or on aircraft while over the territory or territorial waters of Ceylon, the use of wireless telegraphy on board such ships while in such waters, or aircraft while over such territory or territorial waters, by such further rules as the Governor may deem fit to make from time to time either in all cases, or in such cases as may be deemed desirable.
- (3) Provided that no regulations made in respect of the matters described in paragraphs (g), (j), and (k) of sub-section (2) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.
- (4) When making rules for the conduct of any telegraph established, maintained, or worked by any person licensed under this Ordinance, the Governor in Executive Council may, by the rules, prescribe fines for any breach of the same. Provided that the fines so prescribed shall not exceed the following limits, namely:
- (i) When the person licensed under this Ordinance is punishable for the breach, one thousand rupees, and in the case of a continuing breach a further fine of two hundred rupees for every day after the first during the whole or any part of which the breach continues.
 - (ii) When a servant of the person so licensed, or any other person, is punishable for the breach, one-fourth of the amounts specified in clause (i)
- (5) And in default of payment of any fines mentioned in sub-section (4) (i) and (ii), the court may impose imprisonment of either description for a term not exceeding six months.
4. Section 20 of the principal Ordinance, as the same is set forth in section 7 of Ordinance No. 15 of 1914, shall be amended by the insertion of the words "or imports or sells or attempts to import or sell any apparatus for wireless telegraphy" immediately after the word "telegraph" in line 2 of sub-section (1) thereof.
5. Section 41A of the principal Ordinance, as the same is contained in section 8 of Ordinance No. 15 of 1914, shall be amended in the following respects:

- (a) By the insertion of the words "or any apparatus for wireless telegraphy has been imported or sold" immediately after the word "worked" in line 4 thereof;
- (b) By the insertion of the words "or aircraft" immediately after the word "ship" in line 6 thereof;
- (c) By the substitution of the words "ship

or aircraft" for the words "or ship" in line 8 thereof; and

(d) By the insertion of the words "or to have been imported or sold" immediately after the word "telegraphy" in line 9 thereof.

By His Excellency's command,
Colonial Secretary's Office, CECIL CLEMENTI,
Colombo, May 14th, 1923. Colonial Secretary.

C RULES made January 31st, 1924, by the Governor in Executive Council, under section 7 of "The Ceylon Telegraph Ordinance, 1908," as amended by Ordinance No. 10 of 1923.

INSTALLATION, ETC., OF WIRELESS TELEGRAPHS.

1. (1) No person shall import for private use, install, establish, maintain, or work any wireless telegraph station or apparatus in any place in the island or on board any British ship registered in the island, or shall install, establish, or work any wireless telegraph station or apparatus on board any aircraft in the island, unless such person has applied for and obtained a licence in that behalf from the Postmaster-General.

(2) Any person desirous of obtaining a licence for any of the purposes mentioned in the preceding paragraph shall apply to the Postmaster-General in the Form A in the Schedule hereto, and every such application shall have affixed to it a stamp of the value of ten rupees.

(3) Every such licence shall be in the Form B in the Schedule hereto and shall be subject to the conditions mentioned in the said licence.

IMPORTATION FOR TRADE PURPOSES AND SALE OF APPARATUS FOR WIRELESS TELEGRAPHY.

2. (1) No person shall import for trade purposes or sell any apparatus for wireless telegraphy, unless such person has applied for and obtained a licence in that behalf from the Postmaster-General.

(2) Any person desirous of obtaining a licence for such importation or sale shall apply to the Postmaster-General in the Form C in the Schedule hereto, and every such application shall have affixed to it a stamp of the value of ten rupees.

(3) Every such licence shall be in the Form D in the Schedule hereto and shall be subject to the conditions mentioned in the said licence.

PERIOD OF ALL LICENCES ISSUED UNDER THESE RULES AND THEIR RENEWAL.

3. (1) All licences issued under these rules shall be for one year, commencing from January 1st in each year and expiring on December 31st of such year. All licences issued during the year shall expire automatically on December 31st of such year. Applications for renewals shall be forwarded on Form E so as to reach the Postmaster-General before December 31st in such year.

(2) The fee for and in respect of all licences shall be ten rupees per annum in respect of each station licence, and shall be paid by postage stamps affixed to the application form.

LICENCES FOR IMPORTATION, INSTALLATION, ETC., OF WIRELESS TELEGRAPHS FOR EXPERIMENTAL PURPOSES.

4. (1) Licences for the importation, installation, establishment, maintenance, and working of wireless telegraph stations or apparatus for experimental purposes shall be granted subject to the following conditions:—

- (a) The applicant shall not be less than twenty-one years of age and shall be a British subject, and he shall furnish satisfactory evidence as to character and

the objects for which he requires the licence.

- (b) The applicant shall satisfy the Postmaster-General that he has in view some definite object of scientific value or of public utility. If scientific research is intended, he must be certified as a competent investigator by a Government Department or some recognised scientific body.
 - (c) The applicant shall satisfy the Postmaster-General that he is competent to work the apparatus according to the terms of his licence, or that he is a *bona fide* student of wireless telegraphy under a person holding a licence to work a wireless telegraph under these rules; and shall undertake not to allow any person other than a person holding a licence under these rules to work the said apparatus.
 - (d) The maximum height and dimension of aerial wire permitted shall be as follows:—
The extreme height of aerial above ground shall be 100 feet.
The total length of wire, including leading-in wire, shall be 150 feet of single wire, or total length of 200 feet of wire where two or more wires are used.
 - (e) For the purpose of reception of signals, not more than one thermionic valve shall be permitted on each station, unless the Postmaster-General at his discretion shall allow more than one such valve.
 - (2) Licences for transmitting stations shall be subject to the following further conditions:—
 - (i) The power used shall not exceed 20 watts.
 - (ii) Transmission shall be sanctioned only to duly authorised wireless stations, within a radius of 75 miles from the transmitting station.
 - (iii) The wavelength shall be limited to a range of 180-220 or 400-450 metres. Applicants shall specify the range they desire to use.
 - (iv) Transmission shall be restricted to a period not exceeding an aggregate two hours per day. The actual times desired shall be specified in the application.
 - (3) Any person to whom a licence to install, establish, maintain, or work any wireless telegraph station or apparatus is granted shall not divulge the purport of any message, other than those intended for him, which may be received on the apparatus.
 - (4) Every person who has obtained any such licence shall, on application to the Postmaster-General, be permitted to import any portion of a wireless telegraph apparatus, without any further licence, provided that it shall be shown to the satisfaction of the Postmaster-General, or an officer authorised by him, that such portion is *bona fide* required to replace a damaged portion of the wireless telegraph apparatus used by such person, or for the purpose of making extensions to such existing apparatus, or to obtain the benefit of later and more up-to-date appliances within the limitations of his licence.
- LICENCES FOR IMPORTATION FOR TRADE PURPOSES AND SALE OF APPARATUS FOR WIRELESS TELEGRAPHY.
5. (1) Licences for the importation for trade purposes or sale of apparatus for wireless telegraphic purposes shall be granted subject to the following conditions:—
 - (a) The applicant shall be a recognised and established dealer in electric apparatus.
 - (b) The licence shall in all respects be subject to all the provisions of the Telegraph Ordinance and to the rules made there-

under which may be in force during the period of the licence.

- (c) No wireless telegraphic apparatus for transmitting purposes shall be imported or sold of greater power than is laid down in Rule 4 (2).
- (2) The licensee shall keep a book record of all licensed apparatus which he imports and of all disposals of the same in such form as the Postmaster-General may direct, and shall produce his stock and book record on demand of the Postmaster-General or of any officer authorised in that behalf in writing by him.

WIRELESS TELEGRAPHS ON BOARD SHIPS.

6. Except with the general or special permission in writing of the Postmaster-General no person shall work or use a wireless telegraph in any merchant ship, whether British or foreign, whilst such ship is in any harbour in Ceylon.

7. No person shall send any message by means of the wireless telegraph in any merchant ship, whether British or foreign, whilst such ship is within the territorial waters of Ceylon, when and where such messages can be forwarded by a Government telegraph.

8. No person shall work or use the wireless telegraph in any ship, whilst such ship is within the territorial waters of Ceylon, in such a way as to interrupt or interfere with service signalling or the transmission of messages between other wireless stations.

9. When communications are made by wireless telegraph between any ship within the territorial waters of Ceylon and a land station the regulations made from time to time by the International Radio Telegraph Convention shall be observed.

10. Nothing in these rules shall apply to the use of wireless telegraphs within the territorial waters of Ceylon for the purpose of making or answering signals of distress.

WIRELESS TELEGRAPHS ON BOARD AIRCRAFT.

11. No person shall, without the general or special permission in writing of the Postmaster-General, work or use a wireless telegraph in any aircraft (other than an aircraft belonging to the Royal Air Force) whilst such aircraft is over Ceylon or the territorial waters thereof, except in accordance with the following restrictions:—

(1) The wireless apparatus shall not be used except during actual flight or in case of forced landing.

(2) The wireless apparatus may be used for receiving messages on any subject, but shall be used for sending messages only on the following subjects:—

- (a) Distress signals.
- (b) Meteorological information.
- (c) Forced landings and landing instructions.
- (d) Ascertaining or indicating position.
- (e) Supply of fuel and spare parts.
- (f) Origin, destination, or course of flight.

(3) The aircraft normal wave (900 metres continuous wave), and no other wave, shall be employed for the sending and receipt of messages to and from—

- (a) Other aircraft.
- (b) Aviation stations.

(4) The aircraft ship wave (600 metres continuous wave), and no other wave, shall be employed for the sending and receipt of—

- (a) Messages to and from all merchant ships.
- (b) Such messages as are rendered necessary by reason of exceptional emergency, and which do not come within the scope of the above-mentioned

provisions for the use of the aircraft normal wave.

(5) The rules made from time to time by the International Radio Telegraph Convention shall be observed.

(6) Service signalling or the transmission of messages between other wireless telegraph stations shall not be interfered with :

Provided that nothing in these restrictions shall apply to the use of wireless telegraphs for the purpose of making or answering signals of distress.

CERTIFICATES OF COMPETENCY.

12. (1) No person shall work the transmitting apparatus of a wireless telegraph in Ceylon or in any ship or aircraft registered in Ceylon, unless such person is a British subject and holds a certificate of competency.

(2) Such certificate of competency shall be issued by such officers as the Postmaster-General may depute, and after such examination as the Postmaster-General may prescribe.

MISCELLANEOUS.

13. For the purpose of any proceedings under these rules, the master or person being or appearing to be in command or charge of any ship or aircraft shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship or aircraft.

14. Any summons or other document in any proceedings under these rules shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship or aircraft on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship or aircraft.

15. The Postmaster-General may refer any matter relating to these rules, on which he requires advice, to a Committee composed of the President of the Radio Society of Ceylon and the Chief Engineer of the General Post Office, for their opinion.

16. Any person aggrieved by any order of the Postmaster-General shall have the right of appeal to His Excellency the Governor in Executive Council, provided the appeal is lodged within one month of the receipt of notice of the order of the Postmaster-General.

SCHEDULE.

Form A.

CEYLON.

Application for Licence to Import for Private Use, Install, Maintain, and Work a Wireless Telegraph Station or Apparatus.

This form of application is similar to that used in Great Britain. The applicant must state his nationality, technical qualifications, particulars of proposed installation, stations with which it is desired to communicate, and must give an undertaking to conform to the provisions of the licence.

If the application is for receiving only, all references to transmitting should be struck off.

Form B.

CEYLON.

License No.

Licence to Import for Private Use, Install, Maintain, and Work a Wireless Telegraph Station (or Apparatus).

The Postmaster-General, in virtue of the powers conferred on him by the Ceylon Telegraph Ordinance, 1908, as amended by the Ceylon Telegraph (Amendment) Ordinances, No. 15 of 1914 and No. 10 of 1923, and of the rules made

thereunder, hereby grants licence and authority to _____ of _____ (hereinafter called the licensee) to import, erect, maintain, and work apparatus for the reception and transmission of signals by wireless telegraphy at _____ subject to the conditions hereinafter set forth :

(1) The apparatus shall be of the character specified in the annexed schedule.

(2) The apparatus shall be used exclusively for experimental purposes or research in the art of wireless telegraphy.

(3) If thermionic valves are used in the receiving circuit, they shall be so connected as not to interfere with any other station.

(4) Where transmitting apparatus is authorised, the licensee will take steps to ensure that no waves outside the range allotted to him are radiated from his apparatus.

(5) The Licensee shall not operate his transmitting apparatus for longer periods than ten minutes at any time.

(6) The apparatus shall be open to inspection at all reasonable times by properly authorised Officers of the Post Office.

(7) If at any time the apparatus of the licensee interferes with the erection, working, or use of any of the Postmaster-General's telegraphs, the licensee shall at his own cost make any alteration to his apparatus which the Postmaster-General may require.

(8) There shall be no divulgence to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or any other use whatever made of any messages, excepting those addressed to the licensee, which may be received by means of the apparatus licensed herein, and the licensee shall be subjected in this respect to the penalties specified in the Ceylon Telegraph Ordinance.

(9) The licensee shall be bound by the rules made to regulate the use of wireless telegraphs, published in the *Ceylon Government Gazette* No. _____ of _____, 1922, and any other rules made subsequently while this licence is in force. He shall also observe all the rules made from time to time by the International Radio Telegraphic Convention which are applicable to the licensed station.

(10) If and whenever an emergency shall have arisen in which it is expedient in the public service that the Governor shall have control over the transmission or reception of messages by the licensed apparatus it shall be lawful for the Postmaster-General or any officer specially authorised by him to take possession of the said apparatus in the name and on behalf of the Governor and to remove or use the same in any way that he may deem fit.

(11) The licensee shall be entitled to reasonable compensation (to be fixed by a sole arbitrator nominated by the Governor whose decision shall be final) for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by clause (10).

(12) The Postmaster-General may at any time by notice in writing, but without assigning any reason, revoke and determine this licence, whereupon the licensee shall at once cease to work the apparatus and dismantle it to the satisfaction of the Postmaster-General. The licensee shall not be entitled to any compensation through such revocation or determination of the licence.

This licence terminates on December 31st, 19—
Signed by the Postmaster-General.

Postmaster-General

Details of Apparatus.

Transmitting:—

— Authorised wavelength metres.
Call sign

Note.—The power authorised must not exceed 20 watts measured in the case of a valve transmitter in the anode circuit and in other cases at the equivalent point.

Receiving:—

Antenna:—

- (a) Description,
- (b) Height, ft.
- (c) Horizontal length, ft.
- (d) Method of support

Hours during which station may transmit (Indian standard time).

The station is licensed to communicate with the following stations only:

N.B.—If the licence is only for receiving wireless messages, all reference to transmitting should be struck off.

Form C.
CEYLON.

Application for Licence to Import for Trade Purposes and Sell Wireless Telegraphic Apparatus.

The applicant must give his full name, address, qualifications, nationality, and premises at which the licensed apparatus will be kept, and must agree to conform to the rules and regulations.

Form D.
CEYLON.

Licence No.

Licence to Import for Trade Purposes or Sell Apparatus for Wireless Telegraphs.

The Postmaster-General, in virtue of the powers conferred by the Ceylon Telegraph Ordinance, 1908, as amended by the Ceylon Telegraph (Amendment) Ordinances, No. 15 of 1914 and No. 10 of 1923, and of the rules made thereunder, hereby grants licence and authority to _____ of _____ (hereinafter called the licensee), to import and sell apparatus for wireless telegraphs, subject to the conditions hereinafter set forth:—

(1) The said licensee is in all respects to be subject to the rules published in the *Ceylon Government Gazette*, No. _____ of _____ and to all the provisions of the Telegraph Ordinances which are for the time being in force.

(2) The licensed apparatus unless and until disposed of in accordance with the provisions hereinafter mentioned, shall be kept at _____ and in no other place without the written permission of the Postmaster-General, and shall not be used for or by the licensee or by any person either on behalf or by permission of the Licensee for the purpose of establishing, maintaining, or working a wireless telegraph, except under and in accordance with a licence granted in that behalf by the Postmaster-General.

(3) The licensee shall not assign, sell, or otherwise dispose of the licence or the licensed apparatus to any person, unless such person produces a valid licence granted by the Postmaster-General authorising such person to establish, maintain, or work a wireless telegraph, or to import apparatus for wireless telegraph.

(4) At the time of every transaction covered by the terms of section 3 hereof, the licensee shall endorse upon the licence of the person with or on behalf of whom the transaction is made:—

- (a) The name, description, and residence of the said person.
- (b) The nature of the transaction and the character and quantity of licensed apparatus involved.
- (c) The date of the transaction;

and shall sign the endorsement, and shall himself keep a copy of every such endorsement and produce it on demand to the Postmaster-General or his authorised agent.

(5) The licensee shall immediately give information of all transactions in licensed apparatus to the Postmaster-General in such manner as the Postmaster-General may direct.

(6) The licensee shall maintain registers of all licensed apparatus which he imports and of all disposal of the same, in such form as the Postmaster-General may direct. He shall exhibit his stock and his registers on the demand of the Postmaster-General or any agent authorised in that behalf in writing by him.

(7) The licensee shall forthwith give information to the nearest police station and to the Postmaster-General of the loss or theft of any licensed apparatus.

(8) If and whenever an emergency shall have arisen in which it is expedient for the public service that the Governor shall have control over the licensed apparatus, it shall be lawful for the Postmaster-General or any other officer specially authorised by him to cause the licensed apparatus, or any premises, gear, or plant connected therewith, or any part thereof to be taken possession of in the name and on behalf of the Governor, and to be used for the service of the Government, and subject thereto for such ordinary services as to the said officer may seem fit, and in that event may enter any premises in which any such apparatus is kept and take possession of the said apparatus and use the same as aforesaid.

(9) Any such officer may in such event as aforesaid, instead of taking possession of the licensed apparatus as aforesaid, direct and authorise such person as he may think fit to assume control of the licensed apparatus either wholly or partly and such manner as he may direct, and such persons may accordingly enter any premises in which such licensed apparatus is kept.

(10) The licensee shall be entitled to reasonable compensation (to be fixed by a sole arbitrator nominated by the Governor, whose decision shall be final) for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by clause 9.

(11) The Postmaster-General may, at any time by notice in writing and without assigning any reason, revoke and determine this licence, and it shall absolutely cease, determine, and become void without the licensee being entitled to any compensation. Apparatus already imported may be disposed of as laid down in sections 4, 5 and 6 of this licence.

(12) This licence terminates on December 31st, 19____.

Signed by the Postmaster-General on behalf of the Governor in Executive Council.

Postmaster-General.

Form E.
CEYLON.Application for Renewal of Licence granted under the Rules for Regulating the Use of Wireless Telegraphs (*vide Ceylon Government Gazette* No. _____ of _____).

I, the undersigned, at present holding a licence No. _____, granted under the above rules, hereby make application for its renewal, and agree to be bound as heretofore by all rules and regulations made from time to time in respect of such licence.

*I desire that the schedule of apparatus annexed to the licence shall be amended in accordance with particulars and diagram on the back of this form.

*Strike out if no alterations required"

CHILE.

(See Maps 49, 52 and 53)

CONTROL.

WIRELESS Telegraphy in Chile is a State monopoly under the management of the Naval Department.

All Chilean wireless stations, both ship and land, are controlled by the Admiralty, and the Wireless Section of the Navy forms part of the general organisation administering naval affairs.

A concession has been obtained in Chile and with the consent of the Government will be transferred to a national company, which will be formed in due course.

Radio Chilena is the name of the Company which has been formed for broadcasting in Chile.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Vice-Admiral Don Miguel Aguirre	Chief of the General Maritime Office	Direccion del Territorio Maritime Valparaiso
Lieut.-Com. Don. V. Merino B.	Head of the Wireless Section ..	Do. Do.

ORGANISATION.

At the present time the number of stations in operation total 78; these include 18 land stations varying in power from $\frac{1}{10}$ kW. to 100 kW. The stations fall under the following classification:—

Ship Stations —	Naval	31
„ „ —	Mercantile	33
Land Stations —	Open to public service ..	12
„ „ —	Control	1
„ „ —	Experimental	3
„ „ —	For aviation services ..	1
„ „ —	Amateur	30
Air „ —	Aero-hydroplane	3
Broadcasting —	„	1

ADMINISTRATION.

Below will be found the Regulations governing the use of wireless in Chile.

A—Law governing wireless service in Chile.

B—Regulations for the Wireless Service.

(Licences and Categories, Wireless Sets, Staff, Service and Documentation, Inspections, Belligerency and Neutrality of the Wireless Stations, Licence for Ship Wireless Station, Wavelength, Licence for Ship Wireless Operator.)

C—Regulations for Radio Communication.

(General Dispositions, Acceptance, Taxation and Payment of Radiotelegrams, Transmission and Reception of Radiotelegrams, School for Mercantile Radiotelegraph Operators, Admission of Students, Examination of Students, Examination for Second and First-class Operators, Repetition Courses and Requalifying for Titles, Syllabus of Oral and Written Examinations.)

D—Regulations for Private, Amateur, and Practical Radiotelegraph Stations.

PROJECT OF LAW GOVERNING THE
WIRELESS SERVICE IN THE
CHILEAN REPUBLIC.
SECTION I.

A ART. 1.—Wireless stations destined to transmit and receive wireless signals to or from other wireless stations in Chile or in any other foreign country, can only be installed and worked by the State.

Nevertheless, the State may permit the installation and working of private wireless stations destined exclusively to experimental work or for purposes of instruction, but under the condition that the power of such stations shall not exceed $1/12$ h.p. All wireless stations installed for experimental or educational purposes shall be submitted to the inspection and control established in the respective regulation.

ART. 2.—All persons that install or attempt to install clandestine wireless stations of any kind shall be liable to punishment according to the regulations of the service and the laws of the country.

The State will confiscate all the material employed in these clandestine stations.

ART. 3.—(a) The State will dispose the installation of all the wireless stations in the country electing the sites according to plans consulting all military, naval and commercial necessities of the country.

(b) In those isolated regions of the country where private persons solicit wireless communication and there exists manifest convenience in the establishment of such communications, wireless stations may be installed, but under the condition that the land required shall be ceded to the State by those interested also the total cost or that part of the cost decided upon by the Government, shall be borne by the persons or parties interested in the said communication.

At the termination of the construction of such stations the same shall pass over wholly to the State together with the land occupied.

ART. 4.—The wireless installations shall be as uniform as possible, and of a national type that shall satisfy the wireless service of the country and the different parts shall, as far as possible, be made in the country.

ART. 5.—All the wireless stations destined to transmit or receive wireless communications of any kind shall be under the charge of the Ministry of Marine, and the stations shall be worked by personnel of the Navy with exception of the Army wireless stations which will be under the charge of the Ministry of War.

ART. 6.—The Minister of Marine will designate the wireless stations that may attend public service of wireless communication.

These stations shall be directly connected to the State land telegraphs, which will serve to connect the wireless stations with the general public.

The tariffs shall be collected under the charge of the Minister for Home Affairs, and the said Ministry shall maintain all relations and communications that the wireless service may cause with other foreign administrations, wireless telegraph companies, telegraph or cable companies.

ART. 7.—(a) Six months after this law is passed no ship will be allowed to enter or leave any of the ports of the Chilean Republic that carries 50 or more persons on board (including the crew), unless the ship is installed with wireless telegraph apparatus.

The wireless apparatus must be in working order and be capable of transmitting and receiving messages at a distance not less than 200 miles during the daytime.

(b) In certain accidental cases expressly

determined by the respective regulations, ships may be allowed to enter or leave Chilean ports, although they may be carrying 50 or more persons on board, and are not installed with wireless telegraph apparatus.

(c) The respective regulation will fix the number of operators, capable of working the wireless installation that all merchant ships must carry according to their class, which class will be determined by the same regulation.

(d) Any infraction or attempt at infraction of this article will be fined the sum of from one to five thousand Chilean gold dollars.

ART. 8.—(a) The wireless apparatus installed on board Chilean merchant ships will be subjected to the conditions that the respective regulations may fix.

(b) All wireless operators on board Chilean merchant ships must be of Chilean nationality.

(c) The Government will establish annexed to the Naval wireless school, the necessary courses of instruction to form operators destined to serve in the National Merchant Marine.

The cost of these courses will be paid for by the companies or persons concerned, in the form to be indicated by the respective regulation.

ART. 9.—In the annual budget funds will be consulted to maintain and increase the State Wireless Telegraph Service.

SECTION II.
GENERAL REGULATIONS OF THE
WIRELESS SERVICE.

CHAPTER I.

LICENCES AND CATEGORIES.

B ART. 1.—Every sailing or mechanically propelled vessel having 50 persons or more on board, including the crew, and not being permanently anchored, must possess an efficient wireless set capable of communicating up to 200 miles during the day.

ART. 2.—(a) Before carrying out any installation whatever, the company or shipowners should apply in writing to the Maritime Territory Section of the Navy, for a numbered copy of the special formulary of licences, in order to fill in the particulars of the wireless set, and return it duly completed to the said authorities.

(b) Subject to the corresponding report by the wireless inspector, this document shall be submitted through the usual channel to the supreme Government for its approval.

(c) Only from the time the licence is approved by the Government will the shipowners be allowed to use the wireless set.

(d) The licences to be made out for a period not exceeding five years.

ART. 3.—It is prohibited to use a wireless set without a licence, or with one when same has expired, unless the companies, shipowners or proprietors, have made an application for its renewal, and this is granted in accordance with Art. 2.

ART. 4.—Such shipowners, companies or proprietors of wireless sets, who should be in need of a duplicate of the licence in order to replace the original one lost or destroyed, must lay before the Maritime Territory Section evidence of the circumstances which caused such loss or destruction. That duplicate will be given by this authority, with the same original number and with the word "duplicate" written in red letters, and diagonally across the first page.

ART. 5.—The following vessels are excepted from the obligation set up in Art. 1:—

(a) Those national ships registered with less than 100 tons, which do a coasting trade exclusively within inhabited canals or sheltered and safe bays.

(b) Those national ships of small cargo which carry ordinarily less than 50 persons on board, are incidentally used for pleasure excursions or others of a sporting character, and consequently carry a greater number of persons. These excursions should not be in excess of four in 30 consecutive days, nor be made outside a radius of 30 nautical miles from the starting point, nor last longer than 24 hours each time.

ART. 6.—Such vessels as are included in Clauses (a) and (b) of the previous article, shall apply in writing to the Maritime Territory Section of the Navy for the corresponding licence, enclosing a maritime authority certificate of the registered port, attesting the right of exception.

The Maritime Territory Section shall make out the licence for periods to be renewed on the 1st January of each year, on the application of the person concerned.

ART. 7.—The wireless station to be classified in three categories namely:—

(a) First category.—To this category belongs those ships that have a permanent service, and that carry more than 50 persons on board and that develop an average speed of 12 miles an hour, and under these conditions run a single trip not exceeding 500 miles.

(b) Second category.—To this category belongs those ships that have a service of limited duration, and that carrying more than 50 persons on board, develop an average speed of less than 12 miles, and under these conditions do not run more than 500 miles per single trip.

(c) Third category.—To this category belongs those ships that have no regular service, and that are not included in the first and second categories.

(d) The categories will be assigned in the licences for installing wireless sets.

CHAPTER II.

CONCERNING THE WIRELESS SETS.

ART. 8.—The type or system of the wireless set is left to the option of the company, ship-owners or proprietors, an express condition being that the circuits composing it should be "syntonised," *i.e.*, have the same period of vibration.

ART. 9.—(a) The power of the wireless set will be sufficient to obtain a distance of 200 nautical miles during the day, and is at all times to be in a state for use.

(b) While wireless communications are being made the minimum power consistent with the distance will be employed.

(c) The companies, shipowners or proprietors will, however, be able to dispose of a higher power than the one set up in Clause (a) of this article, subject to an application being made for it when filling in the particulars of the licence.

(d) The wireless set will be tried at full power once a week to verify its efficiency.

ART. 10.—(a) The normal wavelength is 600 metres and every station must be able to use this wavelength as well as that of 300 metres.

(b) Wireless communications between vessels and with land wireless stations will always be made with 600 metres wavelength; but such characteristic may be, by mutual agreement, altered in cases of difficulty in the transmission, the normal wavelength to be resumed at the end of the transmission of the message.

(c) The waves emitted shall be very pure and as deadened as possible.

ART. 11.—It is prohibited to use the simple vertical radiator, except in cases of signals for help; the aerial of this type, implying that which

allows for the direct transmission of waves by means of sparks.

ART. 12.—The wireless set must be capable of transmitting and receiving messages at a speed of no less than 20 words per minute, calculated at the rate of five words per minute.

ART. 13.—(a) Every wireless station shall be provided with a quantity of spare-parts and tools necessary for repairs and to rapidly replace those elements which may deteriorate by accidents.

(b) A pair of complete telephone receivers to be always kept in reserve.

(c) Similarly, a voltmeter, a hydrometer, electrolite, and distilled water, for the working and preservation of the battery will also be available.

ART. 14.—(a) Between the wireless station and the bridge will be established an efficient communication, for which object a telephone, or speaking-tube, may answer the purpose. Such communication will commence and end at either of the above-mentioned points, or in the chart room, if this is near the bridge.

(b) Should the wireless station be accessible from the bridge the orders may be given by word of mouth, without having a special communication installed.

(c) Verbal transmission of messages by means of a third person is prohibited.

ART. 15.—Any alteration in the apparatus involving a change in the characteristics of the wireless set is subject to the authorisation of the Maritime Territory Direction.

ART. 16.—(a) Where the ship to which the wireless set belongs goes under repairs for more than three months, the licence will be forwarded to the Maritime Territory Direction with a view to writing on it the corresponding annotations.

(b) In case of definitive dismantlement of the ship, or of it being placed on a different service not requiring it to possess a wireless set, the licence will likewise be sent for its cancellation to the Maritime Territory Direction.

ART. 17.—(a) Every ship will have an emergency power independent of the principal electric plant, capable of transmitting wireless messages for four consecutive hours at least, and sufficiently protected against accidents.

(b) The transmitting apparatus will be continuously in a state of working by means of the emergency power at only two minutes' notice.

(c) Before sailing, and daily while at sea, the wireless set will be tried utilising the emergency power, and its results will be noted in the wireless log.

(d) Occasionally, from the land stations, the ships at sea will be called upon to send messages with the emergency power, in order to ascertain their efficient condition.

CHAPTER III.

STAFF, SERVICE AND DOCUMENTATION.

ART. 18.—(a) For the working of wireless sets on board the Chilean mercantile ships, the operator is required to be in possession of the title of wireless telegraphist, conferred by the Maritime Territory Direction of the Navy.

(b) Only Chilean subjects, or naturalised foreigners, in accordance with the Republican Laws, will be able to obtain those titles.

(c) Candidates for the position as wireless operators must pass the examinations set up in Section IV of the present General Rules, and comply with the requirements therein laid down.

(d) Every wireless operator is bound by oath to maintain strict secrecy in the correspondence whatever the nature of this may be.

ART. 19.—The titles are of two classes: First and Second:—

(a) First Class.—Titles of this class will

be conferred upon those operators who, having passed satisfactorily the examinations in Section IV, can send and receive wireless messages at a speed of not less than 20 words a minute (Chapter II, Art. 12).

(b) Second Class.—Titles of this class will be conferred upon those operators who, having passed satisfactorily the examinations quoted in the previous clause, can send and receive wireless messages at a speed of between 12 and 19 words a minute.

ART. 20.—The appointment of wireless operators in the mercantile vessels will be as expressed below:—

(a) First category wireless station.—This will have at least two first class wireless operators.

(b) Second category wireless station.—This will have at least one first class operator and one second class.

(c) Third category wireless station.—This will have at least one first class operator and one second class.

ART. 21.—The service of watchmen will be run in accordance with the category to which the wireless stations belong (Art. 7, Chapter I), as follows:—

(1) First category wireless stations.

(a) The watch will be kept permanently, that is to say, the wireless operator will continuously have the receivers on, or off, but within the premises of the wireless station, when this be fitted with special instruments of communication, such as bells, etc.

(b) The wireless operator will communicate every half-an-hour to the official on duty on the bridge any changes, to show that he has not abandoned his post.

(c) He will make notes on the station log every quarter-of-an-hour, making sure that such notes consist of characteristics of other stations and of other words intercepted.

(2) Second category wireless stations.—The watch will consist of at least 10 hours daily and of 10 minutes at the beginning of each remaining hour; the same obligations as those laid down in the previous clause applying to the operators of these stations while they are on duty.

(3) Third category wireless stations.—The watch will be eventuated, as when entering or leaving the port, in places of much maritime traffic, etc., leaving the organisation of the service to the arbitration of the ship's captain.

ART. 22.—(a) Should an operator fail to comply with the present regulations, the information to that effect being given either by the ship's captain or through the controlling wireless stations, the Maritime Territory Direction of the Navy will have the option of suspending the culprit for a given time, of definitely cancelling his title, according to the gravity of the omission.

(b) Where such omissions are not the fault of the operator himself, but through reasons over which he has no control, or through express orders of the companies, shipowners or proprietors, the Maritime Territory Direction of the Navy, will make the necessary inquiries and the consequent fine will be made against him.

ART. 23.—The wireless service on board a merchant ship is subject to the supreme authority of its captain, who will see that the wireless station is in good order of preservation, efficiency and cleanliness, and that the conditions of the present rules are strictly complied with.

ART. 24.—When ships are in port, the wireless

station will be kept closed, the key to remain, in every case, on board in case the Maritime Authority should desire to make an inspection.

ART. 25.—Every station shall have the following documents:—

- (1) The wireless station licence.
- (2) A copy of the present Rules.
- (3) A copy of the "Berne Official List *re* Wireless Stations," together with its latest supplements.
- (4) Range formularies, in the number required.
- (5) Pages of range formularies.
- (6) A copy of standing tariffs.
- (7) A blackboard placed outside the wireless station wherein will be noted consecutively the wireless stations coming into the range of distance.
- (8) A log of the wireless station.

CHAPTER IV.

INSPECTIONS.

ART. 26.—In pursuance of Art. 44 of the Navigation Law, the stations of all coast mercantile ships, both national and foreign, will be inspected every six months. To this effect the Maritime Authority will delegate its functions on those inspectors mentioned in the subsequent article, who will form part of the Inspection Committee.

ART. 27.—The Maritime littoral will be composed of a general inspection, stationed in Valparaiso, and four district inspections as follows:—

(a) Punta Arenas, covering the whole zone of the Estrecho and canals of Patagonia and Tierra del Fuego.

(b) Port Montt, covering all Chiloe and Moraleda canals, as far as the Penas Gulf, including Ancud Bay.

(c) Talcahuano, covering from Ancud as far as Talcahuano.

(d) Antofagasta, covering from Caldera up to the north.

In charge of the General Inspection will be the "Inspector of Wireless Telegraphy of the National Mercantile Marine." Such inspector will have under his jurisdiction the whole littoral of the Republic.

The district inspectors will be officials in the Navy, competent in wireless telegraphy, either in service or retired. These inspectors will be under their respective Maritime Authority, and are only inspecting the ships of their list, not out of the zones allotted to them.

In Valparaiso the wireless telegraphy inspector will inspect all the other ships.

ART. 28.—The district inspectors will, in all that concerns the obligations under their charge, be under the wireless telegraphy inspector, to whom they must send a report monthly of the ships inspected, giving particulars worth mentioning and suggestions as to the steps which should be taken.

ART. 29.—The Maritime Authorities will be able, when any infraction of the regulations or failure in the installation comes to their knowledge, to decree a special inspection, either by the corresponding inspectors, or in those ports without one, by an official on active service or retired, competent in wireless telegraphy, appointed for the purpose.

ART. 30.—In the half-yearly inspection mentioned in Art. 26, the inspector must pay special attention to the instruments of the station being in good condition, and to the efficiency being what is required of them, and also—

(a) To receive those complaints on the service of communications made by the company, captains, or passengers.

(b) To verify that the wireless set be synchronised to the waves of 300 and 600 metres.

(c) To ask for the presentation of the following documents:—

Licence of the wireless station; to verify that the telegraphists are the number required, and that they are in possession of their titles; to go through the communications records, and investigate any complaints received regarding infractions of the International Regulations, or others. All of which must be recorded in the Navigation Certificate, without which requisite this will be valueless.

ART. 30A.—With regard to foreign ships, not included in Art. 26, the Maritime Authority of the first port at which the ship calls, will, in accordance with the International Convention dispose that the person indicated in Art. 29, shall effect an inspection, making sure that the ship carries the licence from its respective Government in which the working of the wireless station is authorised, and that the operators possess the necessary titles.

Should not these documents be shown to them, the inspectors will be able to verify as to whether the installations comply with the conditions stipulated in the said Convention, and if the personnel is competent.

If such a visit could not be effected, through the want of an inspector, the Maritime Authorities of the other ports at which the ship calls will be advised of it.

ART. 30B.—Excluding the inspections indicated in Art. 26, the companies, shipowners, captains or proprietors, who require it, may apply in writing to the Maritime Authorities, for the inspection of the wireless stations on their ships, or for new installations being effected in them.

The corresponding authority will comply with the request in accordance with the circumstances, and will at once communicate with the Maritime Territory Direction.

ART. 30C.—The tariff for the wireless telegraphy and telephony inspectors will be exclusively borne by the vessel, and are as follows:—

Class of Work.	Wireless telegraphic and telephonic station up to 2 kW. power.	Wireless telegraphic and telephonic station above 2 kW. power.
	Dols.	Dols.
(A) Half-yearly inspection	20'00	30'00
(a) Study of plans and specifications of wireless stations to be installed.	150'00	200'00
(b) Inspection of a wireless station installation ..	250'00	350'00
(c) Installation of a wireless station.. .. .	1000'00	2000'00
(d) Study of plans and specifications for repairs or alterations in a wireless station.	100'00	150'00
(e) Inspection of repairs or alterations in a wireless station.	200'00	300'00
(f) General inspection of a station in service, either compulsory or by application.	75'00	100'00
(g) Partial inspection of a station in service, either compulsory or by application.	50'00	75'00

Kind of Infraction	Amount of the penalty or fine.
(a) Vessels not having any wireless set installed, as stipulated in the Regulations.	Sailing cancelled and fine of from \$1,000 to \$5,000 gold of 18 ct.
(b) Vessels with wireless sets installed on them, but without the necessary licence, through not having applied for it, and for not having renewed that which has expired, or for not having asked for a duplicate of the one destroyed, thus testifying its destruction.	Sailing cancelled, fined with \$500, the requisites to be complied with on payment of the fine.
(c) That vessel which is excepted from having a wireless set installed, but has not applied for its corresponding licence of exception.	\$150, the document to be applied for on payment of the fine.
(d) That vessel which being equipped with a wireless set lacks the necessary spare parts and tools (Art. 13).	\$50 each time the infraction is discovered.
(e) That vessel which being equipped with a wireless set, has no efficient communication between the bridge and the station.	\$25 each time the infraction is discovered.
(f) Any vessel making alterations in its wireless set without previously applying for an authorisation from the Maritime Authority.	\$150 each time the infraction is discovered.
(g) Any vessel which, being equipped with a wireless set, does not possess emergency power (Art. 17).	\$200, to proceed with such installation immediately upon payment of the fine.
(h) Any vessel which, being equipped with a wireless set, does not have the statutory number of operators, and these fail to comply with the provisions of Chapter III.	Cancellation of sailing for first offence, and \$25 for each operator's infraction.
(i) Misemployment of the signal for help	\$5,000.
(j) False communications, talking, discussions, superfluous signals or interruptions (Art. 15, Clause (a), Section III).	\$100.
(k) Any ship which, being anchored in port, uses its installation for directly communicating with other ships.	\$500.
(l) Every infraction of the regulations not made by the operator himself but by other causes over which he has no control, or by express orders of the company, shipowners or proprietors (Art. 22, Clause (b), Section II).	\$300 up to \$1,000.

The power of the stations to be taken at the terminals of the generator.

ART. 31.—Infractions of the regulations incurred by shipowners, companies or operators will be punished with fines for the benefit of the Naval Hospital, as under :—

CHAPTER V.

BELLIGERENCY AND NEUTRALITY OF THE WIRELESS STATIONS.

ART. 32.—When the Republic of Chile is in a state of war, all wireless stations belonging to its mercantile ships will be requisitioned by the National Navy.

ART. 33.—When the Republic of Chile declares itself neutral in armed conflicts among other nations, those national and foreign vessels which patronise her shores will be subject to complying with the articles as laid down below.

ART. 34.—(a) No national wireless station will be allowed to maintain any relationship with either the foreign representatives or those of the Republic, nor demand or supply any information at all, other than through the medium of the Foreign Office.

(b) In some exceptional cases such relations may be directly cultivated, but to do so both the express consent of the Foreign Office and the assent of the Ministry of the Navy and General Army Direction will be required.

(c) All wireless telegraphy or telephony communication regarding the position of the states, or any message capable of disclosing merchant and war ships of the belligerent same, or mentioning their names, is strictly prohibited.

(d) Likewise is strictly prohibited the misuse of signals for help for the purpose of favouring a certain belligerent.

(e) Shipowners and merchant vessel commanders shall give all kinds of facilities to the inspectors and other persons appointed by the State, whether in war-time neutrality or belligerency, in order to control the telegraphic stations as dictated to them by the Government.

(f) The Government will be able, through the Ministry for the Navy, to give orders in such cases as in war time, neutrality or belligerency for the transmission of telegrams in ordinary language.

ART. 35.—Where belligerent states develop their hostilities in waters near the national shores, the following disposition shall be strictly adhered to :—

(a) Any merchant vessel equipped with radiotelegraphic or telephonic apparatus, no matter of what nationality, navigating either within the Chilean littoral or lying anchored in Chilean ports, shall not in any way be able to use this apparatus.

(b) Any merchant vessel equipped with radiotelegraphic or telephonic apparatus, without regard to nationality, calling at any port or cover of the Republic, shall disconnect the aerial on casting anchor. Doors, windows, portholes and other means of access to the station will be sealed by the Maritime Authority. These seals can be broken as soon as the vessel leaves the Chilean littoral.

(c) Any vessel, both national and foreign, staying at a Chilean port for longer than three days shall have the aerial dismounted in the presence of the Maritime Authority, and be kept in the station under seal.

(d) Every operator on a national merchant ship who should become aware of any communications being sent contrary to these regulations, is bound to inform the local Maritime Authorities at once, so that they may take the necessary steps.

(e) Any merchant vessels that, owing to

long stay at a Chilean port, should require going through and cleaning its apparatus, can do so upon obtaining a permit from the local maritime authority. The operation to be effected during working hours and in the presence of the said authority, who at the end of the work will again place the seals thereon.

ART. 36.—Where the belligerent persons develop their hostilities in waters distant from the national littoral, the following dispositions will strictly be adhered to :—

(a) Vessels with fixed sailings, following a route within the country, will be allowed to keep their aeriels connected while lying in Chilean ports, provided that their stay is not longer than three days.

(b) The premises occupied by the station will be sealed only when so directed by the superior Maritime Authority.

(c) Those ships having no fixed sailings, or an established route in the country, whatever their nationality, shall, during their stay in Chilean ports, keep their aeriels disconnected from the time they cast anchor.

APPENDIX No. I.

LICENCE FOR SHIP WIRELESS STATIONS.

1. In conformity with the General Regulations of the Radiotelegraphic Service, of the merchant ships approved by Supreme Decree No..... of..... of..... Mr..... representative of the Company..... is authorised for a period of....., and subject to the undermentioned conditions to install and use a wireless set on ss. of the Chilean Mercantile Navy, for the transmission and receipt of service messages, official and private, at a tariff not exceeding that fixed by the International Convention.

2. The employment of the apparatus authorised by this licence is subject to that which is established by the International Convention of Radiotelegraphy, ratified by the Supreme Government, and also to all the regulations dictated from time to time by the authorities, by Government decrees or by new treaties.

3. The firm or company in possession of this licence should give all information demanded by the authority in the line of business concerned, in regard to entries and leaveings (in accordance with the Radio International Convention), to messages exchanged between the ship and other stations, and will pay to the said authority, when and how it is so indicated, all sums appearing in the respective accounts.

4. During the working of the station, its apparatus will be in charge or under the supervision of a person possessing the corresponding title granted by the Maritime Territory Direction of the Navy.

5. The station will give absolute priority to signals of help or danger, and on receiving or making such signals all other transmission will be stopped and will not be renewed until the communications concerning the ship in danger have been concluded.

6. The station will be ready to transmit danger signals with a normal wavelength assigned by the Radiotelegraphic International Convention, and with sufficient power in order that these signals can be received a distance of 100 nautical miles.

7. The station will use the minimum of energy necessary to effect communications, except in the case of messages concerning ships in danger.

8. The station will exchange communications with any other ship, without distinction of the system of radiotelegraphic installation used.

9. The station should not be used when the ships are in harbour, except in case of danger.

10. The President of the Republic can authorise in war time, strikes, mutinies, etc., to close or dismantle the station, and also to requisition the installation for the use of the authorities, granting an equitative bonus to the shipowners.

11. The Government inspectors or authorities will be able to inspect the wireless station when it is deemed necessary by the Maritime Territory Direction, or the Radiotelegraphic Inspection.

12. The installation should not be modified in any of the details specified in the form below.

FORM OF THE STATION AND ITS APPARATUS.

Ship.....
 Number.....
 Shipowners.....
 Registered Port.....
 International Characteristics.....
 Radiotelegraphic Characteristics.....
 Class of Service..... Hour.....
 Power, primary transformer.....kw.
 Power of the generating dynamos.....
 Normal day range with other ships at sea, in nautical miles.....
 Tariff on board per word.....
 Minimum per radio.....
 System employed.....
 Characteristics of the transmitter used.....
 Type of oscillator.....
 Approximate frequency of spark.....
 Characteristics of the receiver.....
 Type of receiver.....
 Scales of waves of the receiver.....
 from..... metres..... up to..... metres.....
 Aerial, number of masts.....
 Height..... Type of aerial.....
 Wire..... Number.....
 Diameter and class.....
 Dimensions required.....
 Emergency apparatus..... Type.....
 Power of the battery.....
 Day range at sea.....
 This licence will expire on the..... of.....

Radiotelegraphic Inspector.

Director of the Maritime Territory.

Minister of War and the Navy.

APPENDIX No. 2.

REPUBLIC OF CHILE.

TERRITORY MARITIME DIRECTION OF THE NAVY.

TITLE.

For wireless operator of.....
 Class.....
 Inasmuch as.....
 has passed the examination satisfactorily in the following subjects :—

(a) Handling, fitting and care of radio-telegraphic apparatus and batteries of accumulators.

(b) Transmission /and receipt by ear at a speed of..... words per minute.

(c) Knowledge of the radiotelegraphic service international regulations.

He is granted the title of wireless telegraph operator, Class valid for five years.

Valparaiso..... de.....

Note taken on.....

Radiotelegraph Inspector General.....

..... Maritime Territory Director

SECTION III.

RADIO COMMUNICATIONS.

CHAPTER I.

GENERAL DISPOSITIONS.

ART. 1.—For the purposes of public correspondence between two ships and between these and the land stations, only the 300 or 600 metre wave shall be used; this limitation may, however, be increased by the Supreme Government when circumstances warrant it.

WAVELENGTH.

The normal wavelength for the transmission and receipt will be of 600 metres, the station will be for the use of two valves, one of 600 and the other of 300, such as it is stipulated in the International Radiotelegraphic Convention, and the position of the syntoniser for such waves should be clearly marked.

Where the transmitter radiates two or more waves as indicated by a sensitive wavemeter, the energy of the smaller one shall not exceed 10 per cent. of the energy of the larger one; the logarithmic decrement per complete oscillation not to be over 0.2, except when signals for help are transmitted; in such cases the transmitter can be syntonised in order to produce a maximum of interference with a maximum of radiation.

ART. 2.—Ship and land stations, open to public service, are under the obligation of communicating with one another when one of them so desires.

ART. 3.—Both Chilean and Mercantile foreign vessels navigating along the coast of the Republic should give preference to official messages of the Chilean national Navy.

Private or public service radiotelegrams transmitted by mercantile ships, for their part, will have precedence over communication practice among the wireless stations of the Navy, except during the hours applied for by the Naval authority.

ART. 4.—When it is desired to communicate with a land radiotelegraph station, the nearest one must be chosen. There being a range assigned to a distant land radiotelegraph station, it is necessary to wait until this is the nearest.

Length. of Wave.	Current Wave Amperes.	Decrement.	Reading of the wavemeter.	
			Principal Wave.	Next wave to the principal one.
600 metres 300 metres				

ART. 5.—Every station is obliged not to interfere with the communication of the other stations. To this end it is prohibited to exchange conversations not connected with the service among operators.

Likewise it is prohibited to send long series of signals for the syntonisation of the transmitting and receiving apparatus, these operations to be made by means of the trial vibrator. Where it is absolutely necessary to send trial signals, these should be confined to short series, and only after verifying that no other communications are being sent.

ART. 6.—Before starting a call, the wireless station will syntonise its receiver to the regulative wave and will at the same time verify that no communication is being made; otherwise will await the first suspension, unless its call does not disturb the said communication. The same rule will be observed when a call from another station is to be answered.

ART. 7.—(a) Calls for help have priority over all other signals.

(b) As soon as the call for help is perceived all communications will be suspended and will not be resumed until the ship applying for help has finished transmitting its signal.

(c) When a ship making use of the signal for help, adds, after a series of these signals, the characteristic of a certain station, the obligation of answering devolves in the first place upon the said station.

(d) When there is no such indication of characteristic, every vessel perceiving a call for help will answer it immediately. By so doing interference from other radiotelegraph stations will be avoided.

(e) Only one ship must answer at a time.

(f) That ship which believes itself nearest to the danger will take precedence in its communications over the others (if there are any).

ART. 8.—Those regions wherein the radiotelegraphic service is very considerable (Mancha Sea, etc.), a ship's call to a land radiotelegraph station will, generally speaking, not be made except when the latter is within normal distance of the ship radiotelegraph station, and when the ship reaches a distance inferior to 75 per cent. of the normal range of the said land radiotelegraph station.

ART. 9.—When two or more ships call at one time, the nearest land radiotelegraph station will indicate the order in which the radios are to be transmitted, paying attention to the convenience that the interchange of messages is the maximum, and giving preference to the ship which by its position, destination and speed, will be the first to leave its radius of communication.

ART. 10.—(a) If in spite of the precautions indicated, interference in the radio communications are produced, the land radiotelegraph station, to which the previous article refers, will give the order to wait, giving the approximate duration, and the ship stations are obliged to obey the order.

(b) The ship station will inform the land station of the moment in which it proposes to suspend its communications with other stations, as well as the probable duration of the interruption.

(c) To this respect, it must be borne in mind that the land station is the one which has the command of the communications.

ART. 11.—In case of repeated omissions to comply with this regulation on the part of foreign vessels in communication with the Chilean coast, the necessary steps to punish the culprit will be taken with that Government

under whose flag the ship sails. It is the duty of operators on board the Chilean mercantile vessels to record such omissions on their logs, and inform the captains, in order that they may lay these facts before the Naval Authorities.

ART. 12.—The land wireless stations, as it has been directed, will command the public radiotelegraphic service within the radius of its range, excepting the central region of the country, where the said command is performed by the controlling station. In case of danger, the ship station which sends danger signals is the one that commands the communication.

ART. 13.—In the Chilean coasts, in case of war, mutinies, or others to be dealt with by the Naval Authorities, the Chilean fleet will take command of the radio communications in those regions in which they are operating. In such circumstances, all ships, either foreign or Chilean, will obey the orders emanating from the said fleet.

ART. 14.—The radio stations are obliged to send the radios when no direct communication can be established between the station of origin and the receiving station, provided that they are in the position of being able to send them.

ART. 15.—(a) Those radiotelegraphic installations on board merchant vessels anchored in the ports of the Republic, where there is a land station, cannot be used for communication with ships other than through the medium of the land station, except in the case of signals for danger.

(b) Any talk, discussion or superfluous signals through the radiotelegraph is strictly prohibited, the communication is to be limited to what is necessary for a good service.

(c) Similarly, it is prohibited to interrupt a conversation between two stations in order to call a third one, save in the case of danger, or when it is a question of a call for "general stop." In such cases it will be necessary to wait till the transmitting station has finished, to begin immediately afterwards the call in question.

(d) All communications, except in the case of signals for help or danger, are prohibited, when the ship is anchored in any part of the Republic.

CHAPTER II.

ACCEPTANCE, TAXATION AND PAYMENT OF RADIOTELEGRAMS.

Articles 16 to 35 relate to the ordinary routine to be observed in the acceptance and transmission of messages and the rates payable.

CHAPTER III.

TRANSMISSION AND RECEPTION OF RADIOS.

Articles 36 to 58 comprise instructions to operators in the code-signals and general rules for transmitting messages.

As the above follow the general principle laid down in the Service Regulations annexed to the International Radiotelegraphic Convention, we have not considered it necessary to print them in full. A translation of the full text may, however, be found in the "Year Book" for 1924.

SECTION IV.

Relates entirely to the training of operators, the admission of students and the nature of the examinations to be passed.

REPUBLIC OF CHILE.

NATIONAL NAVY.

REGULATIONS FOR PRIVATE, AMATEUR AND PRACTICAL RADIOTELEGRAPH STATIONS.

D ART. 1.—In accordance with Art. 1 of the Regulations of the Radiotelegraphic Service of the Navy, approved by Supreme Decree No. 164, dated 28th February, 1921, the Government will grant permission for the installation of private radiotelegraphic stations, exclusively destined to studies and experiments, provided that the stipulations of the present Regulations are adhered to.

ART. 2.—The power of the station not to be greater than 50 watts, measured at the terminals of the generator.

When oscillation (transmitting) valve is employed the power can be reduced, according to the requirements of the Radiotelegraphic Service.

ART. 3.—Any system of transmitter can be used, except that of direct coupling from the aerial to the oscillator.

ART. 4.—The maximum height and length of the conductor of an aerial will be 30 metres.

When two or more conductors are used, the height and length will be limited to 20 metres.

The length of the aerial will be measured from the leading-in insulator to its extremity.

ART. 5.—The longest wavelength that can be used in the transmission will be 200 metres.

The coupling between the primary and secondary of the transmitters will be such that the two waves produced by the aerial do not differ more than 10 per cent. from the longest.

ART. 6.—The logarithmic decrement of the oscillation of the transmitting aerial must not be greater than 0.2.

ART. 7.—Private stations possessing transmitters, must not be set up nearer than three kilometres from the Government stations.

When a new Government station is established licences to amateurs having their transmitting installations within a radius of three kilometres from the new station will be cancelled.

ART. 8.—The person who desires to install a private station should apply to the Ministry of the Navy, requesting the corresponding licence.

Such application will be handed to the Maritime Territory Director to be forwarded, and through the intermediary of the General Direction of the Navy, to the Ministry of the Navy.

In this application the person concerned will state, besides his name, his father and mother's surnames, nationality, age, profession, address, the locality in which he desires to install his station, and a detailed description of the installation, showing specially the type, power, aerial and purpose of the installation.

ART. 9.—On the receipt of such application the Maritime Territory Direction will, for its information, make sure of the following:—

(a) That the applicant has sufficient knowledge to handle his installation, and that he is capable of transmitting and receiving at least 10 words per minute.

(b) That the position proposed for the station complies with the requirements of the Regulations.

(c) That the system, power, aerial, etc., complies with the requirements laid down in the present Regulations.

(d) That the applicant is in the position to prove his identity by means of his identity certificate.

On registering this application it will also be designated with a corresponding number or mark.

ART. 10.—On the Minister of the Navy granting this licence, the Maritime Territory Director will send it to the Maritime Authority nearest to the place of the installation in order to be handed to the person concerned.

On the Maritime Authority handing the applicant the licence, the former will urge him to declare when he will start and finish his installation.

The licence will hold good for the term of five years, at the end of which the applicant if he so desires, will apply for an extension for another similar period.

ART. 11.—On receipt of the licence from the Maritime Authority the applicant must, under oath, undertake not to divulge the communications which he intercepts, and to use his installation solely for study and experiments, unless the empowered authority should urge him to disclose such communication as he intercepts, or to use the installation for other ends; or that the communications intercepted are of such a nature as to justify their being communicated to some authority in order to avoid misfortunes or other evils; or in the case of news of general interest, such as press or others of the kind.

The Maritime Authority will take down this oath declaration in writing and send it on to the Maritime Territory Direction.

ART. 12.—Once the installation is complete the Maritime Authority will inspect it and make sure that it complies with the requirements herein laid down, and if so, will authorise the working of the station.

He will give an account of all this to the Maritime Territory Director.

ART. 13.—Once the amateur is authorised to work the installation, he must not make any modifications implying changes neither in the power nor in the system of emission, without previous authorisation from the Maritime Territory Director.

ART. 14.—The granted licence only authorises its proprietor to operate with the transmitter of his installation.

ART. 15.—Private stations are subject to the inspections which may be ordered by the Maritime Territory Director.

ART. 16.—They are under the obligation of obeying the immediate orders issued by the stations of the Navy.

ART. 17.—All private stations are, as from the time they receive their licence, subject to the International Regulations and those of the Navy, and to the subsequent measures which the Government at any time might deem desirable to dictate.

ART. 18.—In the event of any breach in the Regulations, the Maritime Territory Director might order the closing up of a private installation and take the necessary steps to carry this into effect.

In such cases the Maritime Territory Director will inform his superiors, so that the cancellation of the corresponding licence may be granted by the Supreme Government.

ART. 19.—Concessions for the establishment of private stations will be considered as cancelled with the promulgation of the decrees ordering the partial or total mobilisation of either the Army or the Navy; in that event the Maritime

Authorities who have issued the licences for the installation, will proceed without further steps to dismantle those stations, the apparatus of which to be placed under their custody or, if necessary, requisitioned and note of the proceedings to be taken in writing.

ART. 20.—The term "radiotelegraphic station" used in the present regulations applies not only to the installations completed, but also to those exclusively designed for receiving and transmitting, whether for radiotelegraphy or radiotelephony.

CHINA

(See Maps 17 and 20)

Including : Manchuria, Tibet and Mongolia.

THE Republic of China in its present form was established on October 10th, 1911. The executive power is vested in a President; whilst the legislative authority is exercised by a National Congress, comprising a Senate and a House of Commons.

CONTROL.

Radiotelegraphy in China is owned and controlled by the Government, and its administration is regulated by the Department of Telegraphs, Ministry of Communications. The Ministry of War and the Ministry of Marine control the use of Radiotelegraphy in the Army and the Navy respectively.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Admiral Y. L. Woo	Minister of Communications	Peking
C. T. Sun	Vice-Minister of Communications	Peking
S. Y. Tsoh	Director-General of Telegraphs	Peking
T. Song	Chief of General Sub-Department of Telegraphs	Peking
L. T. Chow	Chief of Traffic Sub-Department of Telegraphs	Peking
A. H. Eriksen	Adviser	Peking
A. Jørgensen	Wireless Engineer and Instructor	Peking
C. C. Casperd	Wireless Engineer	Peking

ORGANISATION.

The coast and inland stations administered by the Ministry of Communications are ten in number, including those of Woosung, Canton, Foochow, Shanghai, Tsungming, Wuchang, Kalgan, and Peking, of which the last five are coast stations open for public service, while the remaining three are official stations. Three new stations of the Marconi type (25 kW.) have been erected at Kashgar, Urumchi, and Urga, the last being operated by the Soviet authorities. One 50 kW. station and five 5 kW. stations will be erected in Yunnan Province. These stations will be of the Poulsen type.

At Peking, Woosung and Wuchang the existing Quenched-Spark system is being replaced by Transmitting Valves.

The Ministry of Communications contemplates the establishment of a central station near Shanghai equipped with two 1,000 kW. arc sets and branch stations in Harbin (200 kW. arc), Shanghai, Peking and Canton (each 100 kW. arc).

There is a new 500 kW. station at Peking owned by the Japanese Government which handles official traffic between the Japanese Legation at Peking and the Japanese Foreign Office at Tokio. The Alexanderson Alternator system is employed and the wavelength is 16,000 metres. Call-sign XYZ.

Unless the recommendations of the Washington Conference are adopted no wireless station can handle commercial traffic until 1930, when the cable monopoly expires.

Experimental stations are installed in the Y.M.C.A. Head Office and the Universities at Nanyang. Peiyang and Chiaotung.

The Nanyang University also collects press messages transmitted from Europe, America, Honolulu and the Philippine Islands for dissemination to local newspapers.

The Ministry of Communications is considering draft regulations relating to broadcasting and private stations.

There is already a broadcasting station at Hongkong run by the Hong-Kong Hotel Company.

It has been proposed to erect several small stations of from $1\frac{1}{2}$ to 5 kW. in Outer Mongolia and at some important points in Chihli Province.

The Naval Board has purchased a very large station of 500 kW. from a Japanese factory. The erection of this station was started in 1920.

A *Radio Training Station* was opened in Peking in 1913. It is controlled by the Ministry of Communications.

ADMINISTRATION.

At present radiotelegraphy in China awaits development and the laws and regulations affecting the subject consist, therefore, of those formulated to govern the working of the ordinary wired telegraph and telephone applied, as far as they are applicable, to radiotelegraphy. For this reason we present here a translation of the Chinese general regulations affecting all electrical means of communication, with a few comments emphasizing the points which appear to affect wireless telegraphy, and also form of licence for pilot boats.

A—Instructional Order No. 20.

B—Form of Licence for Pilot Boats.

INSTRUCTIONAL ORDER No. 20.

A

Dated April 18th, in the fourth year of the Republic of China—i.e., 1915.
REGULATIONS AFFECTING ELECTRICAL MEANS OF COMMUNICATION.

ART. 1.—All telegraphs and telephones, whether wired or wireless, shall be included in the term "Electrical means of Communication."

ART. 2.—All electrical means of communication shall be owned and controlled by the State.

ART. 3.—The following electrical means of communication may be set up by private individuals or corporations after the sanction of the Government has been obtained:

(a) Those established for the exclusive use of railways, mines, or other specific and commercial enterprises.

(b) Those which are set up by individuals or corporations or official departments on their premises for the purpose of establishing connection with a public telegraph office for the convenience of the transaction of the business carried on by the said individuals or corporations.

(c) Those which are used by individuals, corporations, or official departments for intercommunication between various parts of the building in which they are located.

(d) Those which are used by ships in transitu.

(e) Those which are set up for the purpose of experiment or research.

(f) Telephones whose calling powers are to be confined within a certain definite area. These must not, however, be erected in any area which is at present furnished with telephonic communication.

[This clause appears to be one intended to apply to future telephone installations and not to any which may be at present erected. Of the above items it will be noted only (d) and (e) can apply to wireless telegraphy.]

ART. 4.—The Government, in case of necessity, may, in accordance with the pro-

vision of Laws and Edicts, seize all private electrical means of communication and convert them to public or military use. When, under the provision of this regulation, the Government so seize and make use of privately owned electrical means of communication, it may appoint officials to take charge of and work them.

ART. 5.—When the Government consider it necessary in the interests and for the maintenance of public safety, they can restrict, suspend or cancel any use of electrical means of communication within certain prescribed areas.

ART. 6.—The Superintendent officials at telegraph offices controlled by the Government may suspend the transmission of any message or refuse altogether to accept it, when they consider its contents to be opposed to public safety.

ART. 7.—When special circumstances or force majeure cause telegrams to be delayed in transmissions or prevent their transmission, the senders cannot claim compensation for damage arising from such delay or hindrance.

ART. 8.—Correspondents are themselves responsible for the contents of their messages.

ART. 9.—With regard to the transmission of telegrams or telephone messages no exemption with regard to liability or responsibility can be entertained on the ground of mental deficiency on the part of the sender.

ART. 10.—Telegrams received at public telegraph offices—other than those specified by Government orders—will be delivered in accordance with the addresses given by the sender. If, owing to the fact that the address given is incorrect or insufficient, the telegram cannot be delivered, this fact will be publicly announced, and if no application for the message is received within forty-two days from the date of the public announcement, the said message will be destroyed.

ART. 11.—When messages are received in secret code, or in obscure or metaphorical language, the telegraph officials may, if they think fit, call upon the sender to translate the

code or elucidate the meaning of the message. If the sender refuses to decode or explain, or, in complying with this request, fail to put the telegraph official truthfully in possession of the real meaning of the message, the official may stop the transmission of the said message.

ART. 12.—Officials, workmen, or messengers engaged in the performance of their duty in connection with telegraphs or telephones are not to be interfered with or stopped by the authorities of the customs or by those operating the canal locks.

ART. 13.—Officials, workmen, or messengers when proceeding in discharge of their official functions are to be allowed unhindered transit over building land and fields (with the exception of those enclosed by walls and gateways) whenever there may be any hindrance to their transit through the regular streets or paths. But if the passage of such officials, workmen, or messengers causes damage to be done to buildings, or to crops in cultivated property, the Government will pay adequate compensation on the application of the owner and on his proof of such damage.

ART. 14.—When officials, workmen or messengers engaged in performing their official functions ask for help or assistance in order to overcome any special hindrance in transit, or when they ask for assistance in climbing mountains or crossing rivers, the persons to whom such request is made may not refuse such help or assistance without assigning adequate reason for so doing. But in the event of such assistance being tendered, the Government will give the person rendering it fit and proper remuneration for such aid and assistance on his application for such remuneration.

ART. 15.—Telegraph or telephone wires may be set up at convenient places, no matter through what property it is necessary for them to pass; but if their erection involves an encroachment on the rights of others, whether private individuals or corporations, the Government will on application allot adequate compensation for such encroachment.

ART. 16.—Charges for telegrams and telephone messages shall be collected in cash according to fixed rates.

ART. 17.—Materials used for the purposes of Telegraph and Telephone Services shall be exempted from tax, but not from customs Duties.

ART. 18.—With reference to the compensation for damages caused, and the right of application for remuneration referred to in the above clauses in connection with the carrying out of Electrical Means of Communications, the period within which such right to compensation or remuneration may be dealt with, and the manner in which it may be so dealt with and adjudicated, shall be regulated by separate "Instructional Orders."

ART. 19.—Any who may offend against Articles 2, 3, 4, 12, 13, and 14, shall be liable to a fine of from 5 to 200 dollars. Those who offend against Articles 2 and 3 shall, in addition to fines, be liable to confiscation of poles, wires, machines or other apparatus.

ART. 20.—The conditions laid down in Articles 12-19 shall not be applicable to private electrical means of communication, but the specially authorised telephones erected under section (f) or Article 3 may adopt the regulation comprised in Article 16.

ART. 21.—All Laws, Orders or Treaties affecting telegrams between China and Foreign Countries shall have their respective provisions observed and the provisions of this Instruc-

tional Order shall not be held to modify or abrogate them.

ART. 22.—These regulations shall come into force immediately on the date of their promulgation.

FORM OF LICENCE FOR PILOT BOATS IN CHINESE WATERS.

B The (hereinafter called "the licensee") is hereby granted licence to operate within the pilot district of the wireless telegraph system installed on board the Pilot Boat, as specified in the schedule hereto for the period commencing the and terminating on the, on payment of the sum of ten Mexican dollars, being the licence fee for the privilege above named.

This licence is subject to the following terms, conditions and restrictions:—

1. The licensee shall not establish, install or operate any apparatus for wireless telegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto.

2. The range of signalling shall at no time exceed one hundred nautical miles.

3. The licensee shall use the licensed apparatus solely for the purpose of exchanging with ships at sea messages relating to the safe and prompt working of the licensee's pilot service, and for making or answering calls of distress. However messages originating or terminating on board the aforesaid pilot boat may be exchanged with the Chinese wireless coast stations at on payment of the ordinary charges accruing to the Chinese Telegraph Administration for wireless messages exchanged by means of the said stations. Payment of such charges shall be made in such manner as the Ministry of Communications shall direct.

4. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the transmission or receipt of messages, except messages authorised under paragraph three.

5. All telegrams exchanged by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose. Such registers as well as the licensed apparatus shall be open to inspection by thereto authorised officers of the Chinese Telegraph Administration.

6. The licensee shall operate the licensed apparatus in accordance with any regulations which may be issued from time to time by the Ministry of Communications.

7. The licensee shall observe the provisions of the International Radiotelegraphic Service Regulations of 1912, as regards transmission of messages (Article XX—Article XXXIV) in so far as they are not inconsistent with the rights and privileges granted by these presents.

8. The licensee shall so operate the licensed apparatus as not to interfere with:—

(a) Naval signalling by means of any system of wireless telegraphy between two or more ships of the Chinese Navy or between a ship of the Chinese Navy and any other wireless station, whether on shore or on any ship;

(b) The working of any wireless telegraph station lawfully established, installed, or worked in China or the territorial waters thereof, and in particular the licensed apparatus shall be so worked as not to interrupt or interfere with the transmission

of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations on ships at sea.

9. The licensee shall not work or use the licensed apparatus whilst the boat is in the harbour of , except with the special permission in writing of the Ministry of Communications.

10. Regulations 8 and 9 shall, however, not apply to the use of the licensed apparatus for the purpose of making or answering signals of distress.

11. The licensed apparatus shall not, without the consent in writing of the Ministry of Communications, be altered or modified in respect of any particulars mentioned in the schedule hereto.

12. The licensee, in case the aforesaid pilot boat be sold or dispensed with and remain in Chinese waters, shall remove the wireless apparatus before transfer of ownership takes place.

13. The licensee shall operate the licensed apparatus only during the hours indicated on the schedule hereto, except for the purpose of making or answering signals of distress.

14. The licensee shall at all times indemnify the Ministry of Communications against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

15. If, and whenever, in the opinion of the Ministry of Communications, the interests of the Government of China demand that the use of the licensed apparatus shall be prohibited or shall be under full control of the said Government, the licensee shall conform

to all directions prescribed by the Ministry of Communications.

16. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, the licensee shall be liable for every such breach, non-observance or non-performance to a penalty of one hundred Mexican dollars, and in every such case the Ministry of Communications may, by writing, revoke and determine these presents, and the licence herein granted shall become null and void.

17. This licence or a confirmed duplicate of it shall always be carried on board the aforesaid Pilot Boat.

The Schedule of Ship Stations before referred to:—

1. Name of ship on which station established.
2. Nationality.
3. Call signal.
4. Normal range of signalling in nautical miles:—
 - (a) by day;
 - (b) by night.
5. Character apparatus:—
 - (a) Radiotelegraph system with the characteristics of the system of emission;
 - (b) Wavelengths in metres (the normal wavelength to be underlined).
6. Hours of service.
7. Power:—
 - (a) Source and maximum output.
 - (b) Maximum antenna energy.
8. Alternator:—
 - Number of cycles per second.

COLOMBIA

COLOMBIA is a Republic. The President, who is elected by popular vote for a period of four years, appoints the Governors of the fourteen Departments into which the country is divided. The Parliament consists of two chambers, viz., the Senate and the House of Representatives.

CONTROL.

The control of wireless telegraphy and telephony is vested in the Minister of Posts and Telegraphs (General J. M. Valdivieso), who is ultimately responsible. This Minister has recently reorganised the Department.

ADMINISTRATION.

Radio communication is, by Colombian law, constituted a public service under State control, though no special regulations governing its practice, either officially or commercially, have been issued. The Government has, however, granted concessions under which radiotelegraph services may be operated by commercial companies. Marconi's Wireless Telegraph Company, Limited, have constructed, and have operated since April 12th, 1923, the international station at Bogotá; it has constructed, and has worked since April 12th, 1923, four stations—at Barranquilla, Medellin, Cali and Cucuta—which were built for the Government. The same company has refitted the station in the island of San Andres (Caribbean Sea), and operates it on behalf of the Government.

The station at Santa Marta is owned and operated by the United Fruit Company, and that at Cartagena by the Telefunken Company, both of these stations being primarily devoted to traffic with ships. The station at Puerto Colombia, erected and owned by Marconi's Wireless Telegraph Company, is temporarily closed.

Marconi's Wireless Telegraph Company has concluded contracts with the Government for the supply and erection of ten receiving stations—

at Popayán, Pasto, Ibagué, Honda, Tunja, Bucaramanga, Barrancabermeja, Ocaña, Cartagena and Manizales—and for the equipment and management of a State School of Wireless Telegraphy and Telephony at Bogota.

COSTA RICA

(See Maps 44 and 47.)

CONTROL AND ORGANISATION.

THE control of wireless telegraphy and telephony is a State monopoly. The only station in regular service is at Port Limon; this is owned and operated by the United Fruit Co. for the requirements of their business and for general public service.

The Government have a small station on the Nicaraguan frontier, but this only works spasmodically, and is at present in disrepair.

Two larger stations are in course of erection in Costa Rica.

ADMINISTRATION.

Wireless telegraphy is the subject of Laws and Regulations, of which we have only been able to obtain the following:—

A—Decree 34 of 10th April, 1920.

B—Decree 25 of June, 1922.

C—Decree 20 of 3rd August, 1921.

A WITH REGARD TO THE RADIOTELEGRAPHIC STATIONS IN COSTA RICA.
No. 34.

FRANCISCO AGUILAR BARQUERO

Provisional President of the Republic of Costa Rica.

DECREES.

ART. 1.—The wireless telegraph and telephone, which are services of public utility, are declared to be the monopolies of the State. The concession and rights for their exploitation can only be obtained for a limited period and by means of a contract which necessitates the approval of the legislative authority for its validity.

ART. 2.—There can be no question of concession regarding the right, which the State reserves to itself in perpetuity, to establish radiographic stations in the territory of the Republic for military purposes, and for the transmission and reception of official messages.

ART. 3.—The executive authority, in accordance with the regulations which it prescribes, shall be able to authorise the amateurs and the institutions for instruction to install radiographic apparatus for experimental purposes, it being always understood that they should not violate the secrets of the correspondence of the wireless communications, disturb their working, nor use their apparatus for commercial purposes.

ART. 4.—The foundation, handling and exploitation of the wireless telegraphy and telephone establishments for international service can only be permitted to natives of Costa Rica, singly or in co-operation, under the superintendence and protection of the State. The concession thus obtained, and the establishment and the capital which arise from it, shall be unattachable, and shall not be able to be violated in any case, nor for any reason, without the previous consent of the Constitutional Congress.

ART. 5.—The permission conceded for such wireless stations as are already established in

the country can be revoked at any time, and their respective plants pass to power of the State against the corresponding indemnity.

Given at this presidential house, San José, on the Tenth day of the month of April, of One thousand nine hundred and twenty.

FRANCISCO AGUILAR BARQUERO.

The Secretary of State for Foreign Affairs and Offices appertaining thereto.

ANDRES VENEGAS.

The Secretary of State for the Interior and the Police.

CARLOS M. JIMENEZ.

The Secretary of State for the Treasury and Commerce.

CARLOS BRENES.

The Secretary of State for Public Works, etc.

P. PEREZ ZELEDON.

The Secretary of State for Public Instruction.

J. GARCIA MONGE.

The Secretary of State for War and the Navy

AQUILES BONILLA G.

OFFICIAL SECTION.

LEGISLATIVE BODY.

DECREE No. 25.

B THE CONSTITUTIONAL CONGRESS OF THE REPUBLIC OF COSTA RICA.

ORDERS.

ART. 1.—That authorisation be given to Messrs. Ricardo Pacheco and José Joaquín Carranza, engineers, to form a limited liability company, which shall be called *Compañía Radiográfica Internacional de Costa Rica*, which will exploit the concession granted to them by Order No. 47 of the 25th of July, 1921, and will assume all the obligations of the concessionaries.

ART. 2.—The company, which is formed with this object, will be by registered shares, which can only be subscribed for and transferred by and to subjects of Costa Rica, who must be subject to all laws and regulations as per order No. 34 of the 10th of April, 1920.

Communicated to the executive body.

Given in the Sessions Hall of the Congress—National Palace—San José, on the 23rd day of the month of June, of the year 1922.

ARTURO VOLIO, President;

JORGE ORTIZ E., First Secretary.

NAUTILIO ACOSTA, Under Secretary.

President's House, San José, on the 24th day of the month of June, of the year 1922.

Executed, Julio Acosta, Secretary of State for Public Works.

NARCISO BLANCO.

DECREE No. 20.

JULIO ACOSTA GARCIA,

Constitutional President of the Republic of Costa Rica.

ORDERS

C The following regulations for wireless installations.

ART. 1.—Radiotelegraphic and radiotelephonic stations belonging to amateurs and instruction institutes may only work when they have obtained a written permit from the Minister of the Interior, which may be cancelled whenever it is deemed necessary. Said stations will not use a longer transmission wave than 200 metres, nor a transformer which exceeds 1 kilowatt, and cannot use a valve of more than 5 watts except by special authorisation of the legislative body, according to Decree No. 34 above quoted.

ART. 2.—If in the above-mentioned stations the transmitter is of such a nature that it radiates power in two or more wavelengths, more or less defined in accordance with a sensitive wave, the power of the shorter waves must not exceed the power of the longer by more than 10 per cent.

ART. 3.—The logarithmic decrement by

complete oscillation in the series of oscillations emitted by the transmitter of the stations referred to, shall not exceed two-tenths.

ART. 4.—No person or persons holding stations or cognisant of the handling of such, before mentioned, shall divulge or make public the contents of any message whatsoever they may receive. All such as are deemed culpable of divulging or making public any message shall be fined the sum of 250 colons or be imprisoned for three months, or both if it should be so decided. In case of this offence occurring, he who is guilty of it shall be exposed to the cancellation of the licence conceded, and to the confiscation of all the apparatus in use at the station. There will be, moreover, in such punishment as is incurred by those who violate the correspondence, everything in accordance with the laws of the country.

ART. 5.—All station apparatus described in Art. No. 1 of this order shall be sealed by the Inspector of Communications, and if at any of his visits to said stations he should find any seal broken or replaced, he shall expose the guilty party to confiscation of his installation and apparatus and the cancellation of his licence.

ART. 6.—The official establishments for tuition, once their licence obtained, may make such experiments as will serve for tuitional purposes, always refraining from disturbing or causing interference to the international office or to others which are authorised by the Government.

Given in the House of the President on the 3rd day of August, One thousand nine hundred and twenty-one.

JULIO ACOSTA.

The Secretary of State for the Interior.

EQUILES ACOSTA.

CUBA

(See Maps 35, 39, 40, 44, 45 and 46).

CUBA is an independent State under the Government of a President.

CONTROL.

The radiotelegraphic service is controlled by the Government and is carried on under the direction of the Department of Communications.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Armando Cartaya	Director-General of the Department of Communications	Havana
Sr. Juan A. Montalvo	Sub-Director of the Department of Communications	Havana
Sr. Arturo Novo	Chief of the Department of Technical Inspection	Havana

ORGANISATION.

At present there are nine coast stations, all of which are open to public correspondence with ships. The original stations at Santiago de Cuba and Camaguey were removed to the coast towns of Chaparra and Baracoa and more powerful stations have been erected in their place. The station at Guantanamo, controlled by the U.S. Navy, transmits storm warnings and local weather information. New stations are projected for Cayo Frances and Caibarien which will be fitted for radiotelephony in addition to telegraphy.

A Broadcasting Station in Havana worked by the Cuban Telephone Company transmits concerts, speeches and news of general interest.

The Cuban Government adhere to the terms of the Radiotelegraphic Convention of 1912, and we print below a translation of the Decree No. 186 dated 15th February, 1923, for the regulation of broadcasting, experimental and private stations:—

Whereas: the working of radiotelegraphic and radiotelephonic stations for amateurs, for scientific experiments and for broadcasting set up in the Republic has not been the subject of regulation.

Whereas: it is necessary to organise this means of communication so as to prevent interference with public correspondence, to facilitate experiments and studies in this science, and to give facilities to those who have stations for amusement or recreation.

On the proposal of the Secretary of the Interior, and with the concurrence of the Direction General of Communications.

I RESOLVE:

To put into force the following bases and Regulations:

ART. 1.—The radio telegraphic and radiotelephonic service is considered a public service which may be relegated by the State with the limitations imposed by the same in virtue of concessions granted or to be granted.

The State reserves to itself the right to establish such communications of this kind as it may consider necessary for the performance of its official functions.

ART. 2.—Radiotelegraphic and radiotelephonic stations working in national territory shall be subject to the official inspection of the Department of Communication, by delegation of the Secretary for the Interior.

ART. 3.—Throughout the national territory radiotelegraphic or radiotelephonic tests or trials shall not be effected without the authorisation of the Direction General of Communications.

ART. 4.—The Secretary for the Interior, with the consent of the Direction General of Communications, shall have power to authorise the establishment of radiotelegraphic and radiotelephonic stations of the classes "A," "B," "C," "D" and "E," on the application of private persons, companies, colleges, or national bodies, and subject to the regulations included in this Decree.

ART. 5.—The establishment of radiotelegraphic or radiotelephonic stations of any class shall not be granted to private persons not resident in the national territory, or to foreign companies or corporations which are not subject to the laws of the Republic.

ART. 6.—Proceedings will be taken in accordance with the Penal Code and the administrative regulations, as the case may be, against persons who seek to exploit or do exploit publicly or clandestinely any radiotelegraphic or radiotelephonic system of any class, and against persons who undertake or attempt to undertake clandestinely experiments or tests of radiotelegraphy, radiotelephony or of apparatus applicable to the same. In all these cases the State will confiscate the material which is used in all such exploitations and tests.

ART. 7.—Whatever be the object of the installation, the working of the stations of class "C," "D" and "E" shall be organised, as far as possible, in such a way as not to interfere with the working of another station of the same class, and shall be regulated by the Direction General of Communications.

ART. 8.—All wireless telegraphic and wireless telephonic stations established in the national

territory shall be subject to the provisions of the regulations for State telegraphs and the International Wireless Telegraphic Regulations.

ART. 9.—In case of war, disturbance or public order, catastrophe, etc., the Department of Communications, upon the instructions of the Secretary for the Interior, may appropriate the radiotelegraphic and radiotelephonic stations and use them or close them as it thinks fit.

ART. 10.—When, through disturbance of public order, war or events of a similar nature, stations of the class authorised by this Decree suffer damage or harm, the owners or concessionaires shall not be able to claim any compensation from the State.

TEMPORARY ART.—A period of 30 days from the publication of this Decree in the *Gaceta Oficial* is granted to the owners of radiotelegraphic and radiotelephonic stations which now exist in the Republic without due authorisation in order that they may make application for the same to the Direction General of Communications.

If, at the expiration of such period, authorisation has not been applied for, the Secretary for the Interior will order the confiscation of the apparatus.

REGULATIONS FOR THE INSTALLATION AND WORKING OF THE STATIONS CLASSIFIED AS "A" AND "B" FOR RADIOTELEGRAPHY AND RADIOTELEPHONY, AND "C," "D" AND "E," FOR RADIOTELEPHONY EXCLUSIVELY.

ART. 1.—Radiotelegraphic and radiotelephonic stations, or exclusively radiotelephonic stations, shall be classified according to the wavelength which they use and the energy in watts which feeds the oscillation transformer.

ART. 2.—The stations shall be called class "A," "B," "C," "D" and "E."

ART. 3.—The wavelengths and the energy authorised for each of the classes of stations referred to in the article are as follows:—

Class.	WAVELENGTH		ENERGY.	
	Min.	Max.	Min.	Max.
"A"	Free	200 m.	Free	500 w.
"B"	225 m.	275 m.	Free	500 w.
"C"	300 m.	360 m.	Free	500 w.
	Fixed			
"D"	400 m.	—	500 w.	1,000 w.
"E"	485 m.	—	500 w.	1,000 w.

ART. 4.—Stations exclusively for reception shall be considered to be of Class "A."

ART. 5.—Stations of the classes "A" and "B" may have devices and apparatus for radiotelegraphic and radiotelephonic transmission. On the contrary, stations of classes "C," "D" and "E," shall be used exclusively for radiotelephonic experiments and communications.

ART. 6.—The owners of stations shall be free to choose the system which they are to instal for reception, but as regards the system of transmitter, they are to be subject to the following rules:—

(a) Continuous waves free from harmonics.
(b) Electric energy of absolute constancy in order to avoid oscillations.

(c) Perfect modulation so that the variations of the current of radio frequency generated exactly follow those produced by the voice in the microphone circuit.

(d) Prohibition of transmitters with damped oscillations (spark transmitters).

(e) Construction of the aerial so that none of its conductors can be swayed mechanically.

ART. 7.—Authorisation for stations of class "A" will be granted to wireless amateurs; those for class "B" to teaching establishments and to those who have sufficient training and knowledge to make scientific experiments; those for class "C" to institutions, colleges, companies, professionals, technicians in radiotelephony and national bodies; those for class "D" to national bodies, enterprises and companies; and those for class "E" to meteorological observatories.

ART. 8.—No station may transmit with a wave and energy above the maximum authorised for its class.

A station contravening these provisions shall be fined 20 pesos for the first offence, and, in case of a further infringement, the authorisation will be cancelled.

ART. 9.—Stations of classes "A," "B," "C," "D" and "E," may not exchange communications or messages of a commercial nature or receive or transmit news for purposes of gain.

ART. 10.—The working of stations of the classes "C" and "D" shall be authorised under the following conditions:—

1. They shall not effect service or commissions for the public or transmit communications of private interest.

2. They shall not transmit or accept messages of public service or private interest for land or ship stations.

3. They shall transmit exclusively concerts, lectures, instructions on radiotelegraphy and radiotelephony, speeches, programmes of artistic concerts and news of general interest which are not directed to a person, company, enterprise of newspaper; and

4. They shall not collect any fees for the transmissions or receptions which are made in accordance with these regulations.

ART. 11.—Stations of the corresponding class which have been installed in ships under the national flag destined for recreation and of less than 10 tons burden shall be considered as land stations for the purpose of carrying out the provisions of these regulations.

ART. 12.—Any Cuban citizen or foreigner domiciled in the Republic who is in possession of his civil rights and any company, enterprise or institution which has not been prohibited from so doing by Art. 5 of these Regulations, shall have the right to be authorised to establish a wireless telegraphic or wireless telephonic station of the corresponding class to which he is entitled according to these Regulations.

ART. 13.—When one of the stations authorised by this Decree interferes with or disturbs the working of a Government station, the chief of the latter may ask that the transmitter of the disturbing station shall be put out of action.

ART. 14.—Any person who, whilst transmitting at a radiotelephonic or radiotelegraphic station, receives the request mentioned in the previous article is to comply immediately, and shall not again work his manipulator until the causes which led to the interference have ceased.

ART. 15.—If the interference should be of a permanent character or so often repeated that

it operates to the detriment of the public service, the Direction General of Communications shall order the reduction of the wave and energy of the interrupting station, and, if this is ineffective, may close the station, subject to the authorisation of the Secretary for the Interior.

ART. 16.—Application to avail oneself of the rights granted by Art. 12 must be addressed to the Director General of Communications, and in it the following particulars are to be stated:—

1. The nationality of the applicant.
2. That he is of age.
3. That he knows the text of these Regulations.
4. The class of station which he wishes to instal.
5. The number of the house and street where he intends to instal the station.
6. The apparatus which is to be installed, name of the manufacturer, type of aerial, and height of same.
7. Whether he has a radiotelegraphist's diploma or certificate or that of a professional radiotelephonist.
8. Whether he has any professional or university degree or a certificate that he is skilled or expert in the handling of electrical apparatus.
9. That he will not sell, relinquish or transfer his station without first informing the Direction General of Communications; and
10. That he swears or promises to comply with the conditions imposed by these Regulations and with the provisions of those which were quoted in Art. 8 of these Regulations.

ART. 17.—The aptitude, professional experience and technical knowledge which must be possessed by those who apply for authorisation to instal and work radiotelegraphic and radiotelephonic stations are as follows:—

Class "A," telephonic: practical demonstration in the working of the apparatus.

Class "B," telegraphic: practical demonstration in the working of the apparatus and reception and transmission of 200 words at a speed of not less than 10 words per minute, without making a mistake.

Class "B," telephonic: practical demonstration in the working of apparatus and professional diploma or certificate of proficiency in radiotelephony.

Class "B," telegraphic: practical demonstration in the handling of apparatus and diploma of telegraphist or radiotelegraphist granted by the Direction General of Communications or practical demonstration in receiving and transmitting 500 words at the rate of 15 words a minute without mistakes.

Class "C," telephonic: practical demonstration in handling the apparatus and professional diploma or certificate of proficiency as an electrician or a radiotelegraphist.

Class "D," telephonic: practical demonstration in the handling of the apparatus and professional diploma in electrical science or radiotelegraphist's certificate granted by the Direction General of Communications.

Class "E," telephonic: the same conditions as those required for class "D."

ART. 18.—The practical demonstrations determined in the previous article are to be made before the Inspector or official appointed for that purpose by the Direction General of Communications.

ART. 19.—Educational establishments, companies, enterprises and observatories, which apply for authorisation to instal stations of the classes to which they are entitled under these Regulations, must have a director or person in

charge of the station who holds a radiotelegraphist's certificate granted by the Director-General of Communications or an electrician's or engineer's diploma legally conferred by recognised faculties.

ART. 20.—The working of the apparatus in stations of classes "B," "C," "D" and "E," shall be effected by the technical directors or persons in charge of the stations.

ART. 21.—The electric supply lines of radiotelegraphic or radiotelephonic stations shall be installed by professionals to insure that the capacity and insulation of the conductor may be those prescribed by technical regulations to insure safety from fires or accidents.

ART. 22.—Every station in the classes mentioned in Art. 20 must possess a copy of the International Wireless Regulations, another of the Regulations for the Telegraph Service of the Republic, and a copy of these Regulations.

ART. 23.—The secrecy of public and official correspondence exchanged by stations of the Government, by ship stations and by foreign commercial stations is inviolable; and any person who, availing himself of wireless stations, shall know and divulge what is transmitted shall be punished in accordance with the legislation in force and his apparatus confiscated.

ART. 24.—Any technical Director or person in charge who deliberately or maliciously uses or allows to be used the transmitter of his station to interrupt the communications of stations of the public service shall be punished according to the common law code and his apparatus confiscated.

ART. 25.—It is strictly forbidden to transmit either by itself or in conversations the international distress signal, agreed to be represented by the initials "SOS."

ART. 26.—Any time that the Direction General of Communications deems fit he may order an inspector of the radiotelegraphic service to examine stations of the classes mentioned in these Regulations and to ascertain

whether they possess the required authorisation and if they conform with the conditions stipulated for the class of station which is authorised.

ART. 27.—Radiotelegraphic and radiotelephonic stations authorised by this Decree shall have a conventional call signals which the Direction General of Communications shall allot to each station for the purpose and shall enter in the respective licence.

ART. 28.—The Direction General of Communications shall publish periodically in the Official Bulletin of the Department particulars of the radio stations authorised in the national territory, showing the class and the call signal.

ART. 29.—The authorisations or licences for the installation of stations of classes "A," "B" and "C" shall be valid for one year, reckoning from the 1st July and those of classes "D" and "E" for five years.

ART. 30.—In accordance with the Law of National Taxes the applications referred to in Art. 16 shall have affixed a stamp of the value of ten centavos, and another of the same kind and value, fastened with a tag, to fix it to the licence.

ART. 31.—The Direction General of Communications shall charge one peso national currency for each licence which it grants under this Decree and shall pay these funds monthly into the Treasury General of The Republic.

ART. 32.—Owners of stations authorised by virtue of these Regulations must accept any modifications which may in future be made thereto.

These regulations shall come into force from the time of their publication in the "Official Gazette of the Republic."

Given in the Presidential Palace at Havana, on the twelfth day of the month of February one thousand nine hundred and twenty three.

ALFREDO ZAYAS.

President.

RICARDO R. LANCIS,
Secretary of the Interior.

CYPRUS

(See Maps 3 and 21)

THE government of the island is administered by a High Commissioner (appointed by Great Britain) with the advice and consent of the Legislative Council.

CONTROL.

There are at present no wireless stations on the island and consequently no organisation is in existence.

ADMINISTRATION.

The following Acts and Rules provide for the regulation of wireless telegraphy in Cyprus:—

A—Wireless Telegraphy Law, 1913.

B—A Law to make further Provision with respect to Wireless Telegraphy on Ships.

C—Merchant Shipping (Wireless Telegraphy) Rules, 1923.

A Law enacted by His Excellency the Officer Administering the Government of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, to provide for the Regulations of Wireless Telegraphy.

A Be it enacted by His Excellency the Officer Administering the Government of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, as follows:—

1. This Law may be cited as the Wireless Telegraphy Law, 1913.

2. In this Law:—

"Wireless telegraphy" means any system of transmitting messages or other communications by means of electric galvanic or magnetic signals without the aid of any wire connecting the points from and at which the messages or other communications are sent and received, and includes any apparatus for transmitting

or receiving such messages or other communications.

Provided that nothing in this Law shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The High Commissioner in Council may whenever he shall deem it expedient to do so license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in Cyprus or on board any ship registered in Cyprus.

4. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in Cyprus or on board any ship registered in Cyprus except under and in accordance with a licence granted in that behalf by the High Commissioner.

(2) Every such licence shall be in such form and for such period as the High Commissioner in Council may determine and shall contain such terms conditions and restrictions on and subject to which the licence is granted as the High Commissioner in Council shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding one hundred pounds or to imprisonment with or without hard labour for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence but no proceedings shall be taken against any person under this Law except with the previous sanction of the King's advocate.

(2) If a judge of a District Court or of the Supreme Court is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant authorising the person to whom it is addressed to enter and inspect the station place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The High Commissioner in Council may make regulations for all or any of the following matters:—

(a) for prescribing the form and manner in which applications for licences under this Law are to be made;

(b) for prescribing the fees payable on the grant of any licence;

(c) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship of any nationality in the waters of Cyprus shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established installed or worked in Cyprus or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) for prohibiting except with the special or general permission of the Island Postmaster the working or using of any apparatus

for wireless telegraphy on board a merchant ship of any nationality whilst such ship is in any of the harbours of Cyprus;

(e) for prohibiting or regulating in case at any time in the opinion of the High Commissioner an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships of any nationality in the waters of Cyprus the use of wireless telegraphy on board such ships while in such waters by such further rules as the High Commissioner may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraphs (c), (d) and (e) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the High Commissioner in Council that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy a licence for that purpose shall be granted subject to such special terms conditions and restrictions as the High Commissioner in Council may think proper but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Law or of any Regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Law and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine not exceeding fifty pounds.

(2) All convictions forfeitures and fines under this Law or any Regulations made thereunder may be had and recovered before a District Court.

9. This Law shall come into operation on the 1st day of July, 1913.

Passed in Council the twenty-third day of May, in the year of Our Lord one thousand nine hundred and thirteen.

LAW No. XII, 1922.

B Enacted by His Excellency the High Commissioner and Commander-in-Chief of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, to make further provision with respect to Wireless Telegraphy on Ships.

MALCOLM STEVENSON.

March 15th, 1922.

Be it enacted by His Excellency the High Commissioner and Commander-in-Chief of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, as follows:—

SHORT TITLE.

1. This law may be cited as the Merchant Shipping (Wireless Telegraphy) Law, 1922, and shall be construed as one with the Merchant Shipping Acts, 1894 to 1916, so far as the same shall be applicable or shall be made applicable to Cyprus.

INTERPRETATION.

2. For the purpose of this Law:—

“Passenger steamer” means a steamer which carries more than twelve passengers.

“Wireless telegraphy inspector” means an officer appointed by the High Commissioner under the provisions of this Law.

WIRELESS TELEGRAPHY INSPECTORS.

3. The High Commissioner may appoint officers as wireless telegraphy inspectors, who shall have the same duties and powers as if they had been appointed wireless telegraphy inspectors under the Merchant Shipping (Convention) Act, 1914.

WIRELESS TELEGRAPHY REQUIREMENTS.

4. (1) Every seagoing British ship registered in Cyprus being a passenger steamer or a ship of 1,600 tons gross tonnage or upwards shall be provided with a wireless telegraph installation and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this Law, and shall be provided with one or more certified operators and watchers, at least, in accordance with those rules;

Provided that the High Commissioner in Council may exempt from the obligations imposed by this Law any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

(2) The High Commissioner in Council shall make rules prescribing the nature of the wireless telegraph installation to be provided, of the services to be maintained, and the number grade and qualifications of operators and watchers to be carried:

Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914, as applicable to Cyprus.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds.

(4) A surveyor of ships or a wireless telegraphy inspector may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Law, and for the purpose of that inspection shall have all the powers of a Board of Trade inspector under the Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the High Commissioner in Council to the chief officer of customs of any port at which the ship may seek to obtain a clearance or transire, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Law.

5. The obligations imposed by this Law shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by or under the wireless Telegraphy Act, 1904, the Merchant Shipping (Convention) Act, 1914, as applicable to Cyprus, or the Wireless Telegraphy Law, 1913.

APPLICATION TO SHIPS NOT REGISTERED IN CYPRUS.

5. The foregoing provisions of this Law shall, as from a date three months after the coming into operation of the obligations imposed by this Law on British ships registered in Cyprus,

apply to ships other than British ships registered in Cyprus while they are within any port in Cyprus in like manner as they apply to British ships so registered.

DATE OF COMING INTO OPERATION.

6. This Law shall come into operation on a date to be fixed by the High Commissioner by notice in the *Cyprus Gazette*.

Passed in Council the thirteenth day of March, in the year of Our Lord one thousand nine hundred and twenty-two.

THALES CABABE,
Clerk of Council.

This Law came into operation on August 1st 1923.

C RULES UNDER MERCHANT SHIPPING (WIRELESS TELEGRAPHY) LAWS 1913 AND 1922.

Dated August, 1923.

Order of His Excellency The Officer Administering the Government in Council.—No. 942.

In exercise of the powers vested in him by the Wireless Telegraphy Law, 1913, and the Merchant Shipping (Wireless Telegraphy) Law, 1922, and otherwise and with the advice of the Executive Council His Excellency the Officer Administering the Government is pleased to make and hereby makes the following Rules:—

1. These rules may be cited as the Merchant Shipping (Wireless Telegraphy) Rules, 1923.

The expression "coasting trade" means trade exclusively carried on between ports in the Island of Cyprus.

The number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

2. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of Cyprus shall be worked in such a way as not to interfere with:—

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed or worked in Cyprus or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of Cyprus except with the special or general permission in writing of the Island Postmaster.

4. If at any time in the opinion of the High Commissioner an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules as may be made by the High Commissioner from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

CLASSIFICATION OF SHIPS.

As in the Merchant Shipping (Wireless Telegraphy) Rules 1920, made by The Board of Trade. (See under Great Britain, Item I. Clause 2, p. 224.)

NATURE OF INSTALLATION.

See B.O.T. rules, Clauses 3 to 6.

SHIPS NOT FITTED WITH APPROVED AUTOMATIC APPARATUS.

See B.O.T. Rules, Clause 7.

SHIPS FITTED WITH APPROVED AUTOMATIC APPARATUS.

See B.O.T. Rules, Clauses 8 and 9.

QUALIFICATIONS OF OPERATORS.

14.—(1) Operators shall be graded into three grades in accordance with the rules to be made by the High Commissioner and watchers shall be certificated by the Postmaster-General of the United Kingdom hereinafter called the Imperial Postmaster-General.

See B.O.T. Rules, Clause 10 (2), except that for the words "Postmaster-General" read "Imperial Postmaster-General."

15. The High Commissioner may accept in lieu of the Certificate of the Imperial Postmaster-

General certificates granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force.

16. The Order in Council, No. 563, dated the 9th April, 1914, is hereby cancelled.

17. These Rules shall come into operation on the 1st day of August, 1923.

Given under the hand and official seal of the Officer Administering the Government at Troösos this 1st day of August, 1923.

H. McLAUGHLAN.

Clerk of Council.

(M.P. 1289/20.)

SCHEDULE.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

See Schedule to B.O.T. Rules, p. 226.

CZECHOSLOVAKIA

(See Maps Nos. 8 and 14.)

THE Czechoslovak Republic is the old Kingdom of Bohemia, with some additional provinces.

CONTROL.

The control of the organisation and administration of wireless telegraphy and telephony is in the hands of the Ministry of Posts and Telegraphs.

ADMINISTRATION.

The regulations affecting radiotelegraphy and radiotelephony are contained in the Act of March 23rd, 1923 (No. 60 of the Czechoslovakian Laws and Regulations), and embody the following principles:—

The erection, maintenance and operation of all wireless stations, both transmitting and receiving, and including those on airships and aeroplanes, is a State monopoly.

The Military Administration may establish and maintain wireless stations by agreement with the Ministry of Posts and Telegraphs, but only for the purpose of training Army operators.

The Ministry of Posts and Telegraphs may grant licences for the erection and use of private wireless stations. A Government decree is being prepared containing detailed provision for the granting of such licences. Licences for private transmitting stations will be very restricted, and secrecy of communications stringently protected.

A Government permit is required for the manufacture, sale or possession of wireless apparatus in Czechoslovakia as well as for its importation. This permit is issued by the Ministry of Commerce in conjunction with the Ministry of Posts and Telegraphs.

The wireless stations controlled by the Ministry of Posts and Telegraphs are regarded as forming a part of the general telegraph system and are subject to the same regulations.

The strictest secrecy regarding telegraphic messages must be observed both by employees in the telegraph service and by licensees of private stations. A breach of this regulation is punishable by imprisonment.

It is also a punishable offence to install a wireless transmitting or receiving station without licence, or to sell, keep or import wireless apparatus without a Government permit. In times of war or disturbance these offences will be severely punished. At such times also the State may take possession of licensed wireless stations and indemnify the licensees.

In accordance with the Law of January 27th, 1922 (Section 10), relating to the use of communications and of real-estate for the purposes of telegraphy and in accordance with the provisions of the Government decree of February

1st, 1923, the Telegraph Administration is authorised, upon payment of compensation, to take over private property for the purpose of erecting a wireless station.

Amateur radiotelegraphy is subject to the above Telegraph Act and will be further regulated by the projected Law concerning the manufacture, sale, possession and importation of wireless apparatus. Consequently it is essential that every amateur manufacturer and experimenter must hold a Government permit or licence. The same rules apply to companies manufacturing or selling wireless apparatus and those engaged in radiotelegraphy and telephony.

DANZIG (Free Town of).

(See Maps 3, 8 and 9)

CONTROL.

THE wireless telegraph service is controlled by The Administration of Posts and Telegraphs for the Free Town of Danzig, and is under the direction of the Danzig Telegraph Office.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Councillor Zander ..	Director of Post and Telegraph Administration ..	Danzig
Herr Bodin	Chief Postmaster	Danzig

The coast station KAZ, $2\frac{1}{2}$ kW. spark, transmits on wavelengths from 300 to 1,800 metres and the 1 kW. c.w. station communicates with Libau, Riga and Berlin. There are 17 ship stations on private vessels. Amateur stations for the reception of Broadcast transmission are now authorised, and a Wireless club has been established. There are also 20 receiving stations in the Banks and News offices for collecting Stock-Exchange Reports broadcast from Berlin.

Weather reports and storm signals are transmitted for the coastguards in Hamburg and the air traffic between Königsberg, Danzig and Berlin.

ADMINISTRATION.

For wireless traffic the following rules and regulations, etc., are in force :—

The International Wireless Telegraphy Agreement.

The Law relating to Telegraphy in the German State, of April 6th, 1892.

The German Law of March 7th, 1908, concerning the alteration of the law relating to Telegraphy in Germany, of April 6th, 1892.

The German regulations concerning the working of telegraph installations on foreign ships on the German high seas, of December 12th, 1909.

The direction for wireless telegraphy service for Germany, of June 15th, 1913.

The German telegraph regulation of June 16th, 1904.

DENMARK

(See Maps 8, 9, and 15)

Including Farøe Islands.

THE territory is ruled by King Christian X, assisted by the Cabinet consisting of twelve Secretaries of State, whose power rests upon the possession of a majority in the Lower House (Folketinget).

CONTROL.

Wireless telegraphy is a Government monopoly, and the administration is supervised by the Minister of Public Works.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY AND TELEPHONY.

<i>Officials.</i>	<i>Title.</i>	<i>Address.</i>
Mr. J. F. N. Friis-Skotte	Minister of Public Works	Copenhagen.
Mr. T. F. Krarup ..	Director-General of Telegraphs	Do.
Mr. W. Gordon-Thomsen	Engineer-in-Chief of the Telegraph Department, Inspector of Wireless Installations	Do.
Mr. M. Gredsted ..	Chief Secretary, Chief of Wireless Instruction	
Mr. P. Møller	Traffic Inspector of Wireless Telegraphy and Telephony	Do.
Mr. A. Poulsen	Electrical Engineer, Inspector of Wireless Installations and Instruction	Do.

ORGANISATION.

The commercial use of radiotelegraphy is organised under the supervision of the Telegraph Department and the State Railway Department (both acting under the jurisdiction of the Department of Public Works); the Naval Department and the Lighthouse Department and the War Office. The various departments exercise jurisdiction independently respecting their own radiotelegraphic section.

There are at present seventeen land stations directly controlled by Government (two of them situated in the Farøe Islands); one station for Government traffic only; five instructional stations; three hundred and twenty-five low power ship stations; seventy-five Government vessels, and two hundred and fifty private vessels.

The Danish Government contemplates the erection of a high power station for transatlantic service.

There are no arrangements for the transmission of time signals, but the Lyngby Radio station broadcasts a press message at 1100 G.M.T., and meteorological reports at 0735, 1335 and 1835 G.M.T., and the meteorological Institute at Copenhagen transmits weather reports during the winter.

No forms of licence for radiotelegraphic working have been issued. The regulations for the erection and operation of private wireless stations are under revision, but it is not yet possible to give details. Acts regarding wireless in its application to aviation are also projected, but so far have not eventuated.

Radiotelephonic communication between the Island of Bornholm and the rest of Denmark was established on May 11th, 1923.

ADMINISTRATION.

The first Act to regulate radiotelegraphy in Denmark was passed in 1907 (Act No. 99 of April 19th). New regulations became effective on July 1st, 1913. Both are reprinted below.

A—Act 99 of 1907.

B—Rules dated July, 1913.

C—Act No. 166 of May 1st, 1923.

D—Agreement between Denmark, Norway and Sweden regarding expeditious forwarding of radiotelegrams. See under Norway (F)

A The regulations affecting Wireless Telephony in Denmark are based upon:

ACT No. 99 OF APRIL 19TH, 1907.

1. The Government shall have the sole right to erect and operate wireless telegraphs (radiotelegraphs) within the Danish boundaries and maritime territory.

2. Telegraph stations on board ships under foreign flag must only be utilised on Danish maritime territory when following the regulations to be drawn up in this respect by the Minister for Public Works. The Minister may prohibit every kind of telegraphic communication from such stations and take the necessary measures to carry through such prohibition, when in his opinion circumstances require it.

3. On board ships under Danish flag, not owned by the Government, telegraphic stations must only be fitted and operated both on and outside Danish maritime territory according to licence previously obtained from the Minister of Public Works. In case the conditions concerning the fitting and working of the station stipulated in the licence are not maintained, the Minister may cancel the licence.

In case it is desired that the working of stations being in operation at the time when the Act comes into force, should be continued, an application to that effect must be filed with the Minister for Public Works not later than four weeks after the Act has come into force, the Minister having then to decide whether and on what conditions the operation of the station may be continued.

4. Scientific and technical trials with wireless telegraphy must be made by no others than the State Authorities unless permission to that effect has been previously obtained from the Minister for Public Works.

5. The regulations stipulated in Act No. 84 of May 11th, 1897, Art. 17, concerning the duty as to secrecy incumbent on the officers and functionaries of the Telegraph Department and concerning the punishment they may be subjected to in the case of a breach of the aforesaid duty, should also be applicable to wireless operators. The regulations stipulated in Art. 18 of the same Act concerning corresponding regulations for employers of private companies may also be made applicable towards operators on board ships.

6. Any contravention of the regulations given in Articles 1—4 shall be punished, provided that the circumstances concerned according to their nature do not inflict a more serious punishment, with forfeiture of the apparatus unlawfully placed and utilised. Furthermore, the contravening person may be liable to a fine of up to 400 kroner, which fine shall devolve to the Treasury. Such contraventions shall be dealt with in the same

way as public police cases. The Minister for Public Works shall be the only person entitled to institute proceedings against contraveners of this Act.

REGULATIONS.

B MADE EFFECTIVE ON JULY 1ST, 1913. In accordance with Act No. 99 of April 19th, 1907, concerning wireless telegraphs (radiotelegraphs) and the International Convention concerning radiotelegraphs drawn up in London on July 5th, 1912, supplemented by appendix decisions, finishing protocol and service regulations, the following decisions shall be observed in founding and working of radiotelegraph stations and in the handling of radiotelegrams:

I.—ESTABLISHING OF RADIOTELEGRAPH STATIONS.

1. On Danish soil and on board ships permanently anchored, such as lightships, etc., radiotelegraph stations (coast stations) can only be established by the Government.

2. On board ships under Danish flag, not owned by the Government, radiotelegraph stations (ship stations) may only be established and operated after permission has been previously obtained from the Department of Public Works.

The licence or a certified duplicate of it must always be kept on board the ship.

The licence may be withdrawn if the conditions for the fitting and operation of the station set out therein are not complied with; in such cases the entire apparatus belonging to the station must be removed.

3. Applications for licences to establish and operate radiotelegraph stations on board ships sailing under the Danish flag must be drawn up on forms approved of by the Department of Public Works, delivered and sent in duplicate to the Telegraph Department, and must be supplied with an endorsement to the effect that the station will fulfil the following conditions:

(a) The waves transmitted must be as pure and as little damped as possible; the utilisation of transmitting apparatus, by which the transmitted waves are generated by a direct sparking discharge in the antenna, especially, is only permissible in case of need. The latter arrangement of the transmitter may, however, be permitted in the case of certain special stations (as, for instance, on board small vessels), the primary energy of which does not exceed 50 watt.

(b) The speed of transmission and reception must be no less than twenty words a minute, the word to consist of five letters. New installations utilising an energy of more than 50 watt must be fitted in such a way as to make it easy to obtain more telegraph distances, smaller than the

normal ones, the smallest of which should be about 15 nautical miles (equal about 28 km.). Old installations utilising an energy of more than 50 watt must be altered, if possible, so as to comply with the regulations mentioned above.

(c) The receiving apparatus, protected in the best possible way against disturbances, must be able to receive signals with the wavelengths of up to 600 m., which are stipulated for the ship station.

(d) The primary energy of the station measured across the generator must under no circumstances exceed 1 kW.

(e) Larger energy than 1 kW. may, however, be utilised, if the ship is to interchange telegrams over a distance of more than 200 nautical miles (equal 370 km.) with the nearest station, or if communication, due to interference is not obtained unless by an increase of the transmitting energy.

(f) The station must be operated by one or more operators who have obtained certificates as specified below in Section 7.

The station must not be opened for communication until the telegraph department has issued a certificate, which will not be granted until the department, by inspection is satisfied that the conditions set out in the licence granted by the Department of Public Works have been fulfilled.

II.—INSTALLATION, SERVICE AND OPERATION OF PRIVATE SHIP STATIONS.

4. The apparatus of ship stations must at any time be in strict accordance with the conditions set out in the licence for their establishment.

5. The hours of service of each coast station are decided by the Government Department. As far as the hours of service of ship stations are concerned, these stations are divided into the following three classes:

(1) Stations with continuous hours of service;

(2) Stations with limited hours of service; and

(3) Stations with no fixed hours of service.

During navigation stations with continuous hours of service must be attended to constantly at the aural apparatus. In the case of stations with limited hours of service the aural apparatus must be attended to during all of the hours of service as well as during the first ten minutes of each hour not comprised in the normal hours of service. Stations with no fixed hours of service are not obliged to keep any regular watch over the aural apparatus.

The classification of a ship as regards the hours of service of same shall be stated in the licence.

6. Any ship station must be fitted to utilise wavelengths of 600 m. and 300 m. respectively. The normal wavelength is 600 m. Small ships, may however, be allowed to utilise wavelengths of 300 m.; but they must always be able to receive telegrams with a wavelength of 600 m. During the hours of service each ship station must be capable of being called with its normal wavelengths.

Ship stations maintaining continuous watch and ship stations with limited hours of service shall be bound to have a radiotelegraphic spare installation, the single parts of which must be placed as safely as possible. This installation must have a source of energy of its own and must be capable of being put into use quickly, must be able to work satis-

factorily for at least six hours and must have a minimum range of:

80 nautical miles (equal to about 150 km.) for ship stations belonging to the first class (maintaining continuous watch).

50 nautical miles (equal to about 100 km.) for ship stations belonging to the second class (with limited hours of service).

This special installation is not required in the case of ships, the normal installations of which comply with the requirements of spare installations mentioned above.

7. The service of the ship station must be maintained by operators who are in possession of certificates granted by the Department of Public Works.

In cases of urgent necessity and during one voyage only the service of a ship station may be undertaken by one or more operators holding a certificate from a foreign Government which Government has joined the International Convention concerning radio-telegraphs.

The certificate shall certify:

Partly the ability of the operator:

(a) In the maintenance of the apparatus and knowledge of their working.

(b) In the sending and receiving (by sounding) of telegrams with a speed:

(i) No less than twenty words a minute for obtaining a certificate of first class, and

(2) No less than twelve words a minute for obtaining a certificate of second class.

(c) In the knowledge of the regulations utilised governing radiotelegraphic service.

Partly that the operator shall be bound to secrecy and subject to penalty, etc., for a breach of this condition as in the case of State telegraph operators.

Operators holding a certificate of second class may do service:

(a) On board ships utilising radiotelegraph in their own service or for the correspondence of the crew only.

(b) As assistant operators on board all ships having at least one operator holding a certificate of first class.

Ship stations with continuous service must be operated by at least two operators holding a certificate of first class.

The radiotelegraphic service of the ship stations is placed direct under the master of the ship concerned.

In the event of a contravention of the regulations governing the operation of the radiotelegraphic service, the certificate may be cancelled by the Department of Public Works.

No unauthorised person must be allowed to enter the wireless cabin.

8. If technically possible, ship stations must interchange telegrams with other stations (coast or ship stations), without regard to the system of radiotelegraphy employed at the station concerned. The interchange of telegrams with other ship stations must, however, be so arranged that the working of coast stations is not interfered with, these as a rule having the priority in public telegraph service.

The operation of a station must as far as possible be arranged so that it does not interfere with other stations.

Exchange of superfluous signals and words is prohibited. Experiments and practice shall only be permitted in so far as the service of other stations is not interfered with; therefore, they must be executed with no other wavelengths than those utilised in the case of public telegram exchange, and utilising as little energy as possible.

When a ship is in a Danish harbour her station must only be utilised for communication with ships in distress.

9. According to the London Convention, the Telegraph Department must notify the Berne Bureau of the ship installation, and the Telegraph Department can demand to be furnished with any information regarding the installation, service, and working of a ship station, both for this and for other purposes.

10. The Telegraph Department will see that all conditions for the fitting and operation of ship stations are complied with. The inspectors for this purpose, who are selected by the Director of Telegraphs, must at any time on showing their authority be admitted to inspect and test the station, provided that the ship is within Danish waters. All information required by the said inspectors must be immediately given, and their directions must be complied with, pending the decision of the Director of Telegraphs, or, that of the Department of Public Works.

For the proper carrying out of the inspection each of the inspectors shall be paid 20 kroner for the inspection and a daily remuneration in addition to travelling expenses; such amount shall be paid by the Telegraph Department, but will have to be refunded (on demand) by the owners of the ship in question.

III—HANDLING OF RADIOTELEGRAMS.

11. Radiotelegraph stations open for public service for the transmission and reception of telegrams may be used by any person, unless the public telegram exchange at the station in question is limited to a certain special kind of telegrams (see section 14).

The telegrams are divided into three classes:

- (1) State telegrams.
- (2) Service telegrams.
- (3) Private telegrams.

The right to transmit State telegrams and service telegrams, and the right to priority for such messages, is at any time governed by the provisions embodied in the International Telegraph Regulation and the Inland telegraph Regulation governing the transmission of such telegrams over ordinary telegraph systems.

12. Regarding the radiotelegraph traffic the handling of telegrams is governed by the International Radiotelegraph Service Regulation, Articles XIV-XV, XIX-XL, XLV-XLIX. The handling of telegrams to and from coast stations and over the ordinary telegraph and telephone system is at any time governed by the inland and International regulations for such traffic.

13. State and service telegrams may under all conditions be written in code or cipher. Private telegrams in code or cipher may be interchanged only with coast stations of such countries where this method of communication is allowed.

14. The ship station may be licensed for:
Ordinary public telegraph communication.

Limited public telegraph communication with specified ships, with specified shipping lines, etc.).

Private telegraph communication.

Special telegraph communication (exclusively for State use, etc.).

In the public telegraph communication the following special radiotelegrams are to be received and handled:

- (1) Radiotelegrams with prepaid reply.
- (2) Radiotelegrams (collated telegrams).
- (3) Radiotelegrams to be delivered by express messenger.
- (4) Radiotelegrams to be delivered by post.

(5) Radiotelegrams with more addresses than one.

(6) Radiotelegrams with certificate of arrival. Certificates of arrival are handled on lines of telegraphs only.

(7) Paid service messages, except such as require a repetition or an information.

(8) Express telegrams, which are, however, only transmitted as such on the ordinary lines of telegraphs and under the proviso that the prescriptions of the International Telegraph Regulations are followed.

All stations are bound to receive, answer, and, if possible, further to communicate messages from ships in distress and give these absolute priority.

Ship stations, however, have no responsibility whatever regarding the radiotelegraph communication.

Ship stations intended for public telegraph service shall get such printed forms, service journals, tariff lists, etc., as are necessary for this service, from the Telegraph Department against payment of fixed amounts. It is the duty of the station to take care that a sufficient supply of these things is always available. Such stations must furthermore be governed by all the instructions regarding the installation and operation of the station and the handling of the traffic issued by the Telegraph Department.

15. The abbreviations mentioned below covering the terms also mentioned below may be utilised; they are written between two double hyphens before the address, and are charged as one word:

To be delivered to addressee only	MP
Delivered open	Ouvert
Private express telegram	Urgent or D
x Addresses	TMx
Reply paid x	RPx
Urgent reply paid x	RPDx
Collation	TC
To be delivered per post	Poste
Télégraphie restant	TR
Poste restante	GP
Post registered	PR
Poste restante registered	GPR
Telegraphic certificate of arrival	PC
Telegraphic urgent certificate of arrival	PCD
Certificate of arrival by post	PCP
Express messenger	Express
All addressed to be stated	CTA

16. The entire charge for radiotelegrams shall include:

(1) Charge for the radiotelegraphic handling, namely:

(a) "Coast fee," which shall devolve on the coast station.

(b) "Ship fee," which shall devolve on the ship station.

(c) "Transit fee," for the coast or ship stations being intermediary stations at the handling of the telegrams.

(2) Charge for handling over the ordinary telegraph and telephone system paid according to the general regulations.

The coast fee for Danish coast stations shall be 40 ctm per word, minimum 4 fr.

The ship fee shall be fixed by the owner of the ship station, subject to the approval of the Department of Public Works. It must not exceed 40 ctm. per word; a minimum charge per telegram may, however, be adopted, not exceeding the charge for ten words. Service telegrams concerning telegrams handled exclusively per radiotelegraph are handled without any charge between the radiotelegraph stations, but are liable to charge when passing lines of telegraphs. Press telegrams at a reduced charge will not be received.

17. The entire charge for the handling of a radiotelegram from the sender to the addressee is to be collected from the sender by the station where it originates. The stations must not collect larger amounts than allowed in the tariffs.

18. All pecuniary liability, in consequence of the operation of the ship station is payable entirely by the owners of the ship in question, without regard to whether the liability in any case may have been due to fault or neglect on the part of the operators.

19. The original radiotelegrams with the vouchers pertaining thereto must, if possible, be sent once a month by the ship stations to the Telegraph Department.

20. Reimbursements of charges paid, and accounts with the Telegraph Department, are governed by the International Radiotelegraph Service Regulations, Articles XLI and XLII.

IV.—OTHER REGULATIONS.

21. Stations on board ship under foreign flags must not be operated during the time such ships are in a Danish harbour, except to receive, answer and forward messages from ships in distress.

22. When the interests of the State require it, the Government may reserve to itself the right to prohibit all radiotelegraphic communication from ships, Danish or foreign, in Danish waters, and to make the necessary regulations to carry through such prohibition.

23. The maximum penalty payable to the State by the owners or radiotelegraphic company concerned for contravening the foregoing regulations is 400 kroner (£22), and all unlawfully fitted or utilised apparatus may be forfeited. Such contraventions are dealt with in the public police court, and proceedings may only be taken according to demand by the Minister for Public Works.

24. These regulations shall come into force on July 1st, 1913.

C The regulations affecting Wireless Telephony in Denmark are based upon:

ACT No. 166 OF MAY 1ST, 1923, stating:

1. The regulations relating to wireless telegraphy contained in Act No. 99 of April 19th, 1907, shall also apply to wireless telephony.

2. The Minister of Public Works may on terms set down by him grant licence to or monopoly for installing wireless receiving apparatus.

DOMINICAN REPUBLIC

(See Maps 35 and 45).

THE island of Santo Domingo is divided between two States, the Western being the Republic of Haiti, the Eastern the Dominican Republic. French is the official language of the former, Spanish of the latter.

The constitution of the Dominican Republic dated February 22nd, 1908, was revised on June 13th, 1924.

CONTROL.

The supervision of the wireless service is under the control of the superintendent of Posts and Telegraphs, who, in turn, is subordinate to the Director-General of Posts and Telegraphs, under the Department of "Fomento y Comunicaciones."

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Octavio O. Ocededo, C.E. ..	Secretary of State Public Works and Communication	Public Works Buildings, Santo Domingo City.
Dr. Eduardo R. Soler, C.E. ..	Director-General of Posts and Telegraphs	Senate Building, Santo Domingo City

ORGANISATION.

A 2-kW. set was installed in September, 1913, at Santo Domingo City and regular public communication was instituted with Puerto Rico. In addition to this publicly owned station, there is a station at La Romana (in the Province of Seybo), owned by the Central Guanica (Sugar Refining) Company in Puerto Rico. The latter relays to the British Cable Company in Puerto Rico, and thus touch is maintained with the outside world.

In March, 1919, the two kilowatt set in the Radio Station of Santo Domingo was replaced by a new 5 kilowatt set.

Communication can now be made direct with San Juan, Puerto Rico, without the intervention of the Ensenada Station. It is also possible to have direct communication with Guantanamo, Cuba, especially at night, and with Port-au-Prince, Haiti.

A station is being erected at Haina and two more will be installed, one at Santiago and the other at Puerto Plata for the use of the National Police.

There are no public aviation, meteorological or press services, but there is an extensive storm warning service. The United States air station sends a daily weather report to Washington.

ADMINISTRATION.

There are no special Laws and Regulations relating to wireless telegraphy and telephony.

A public contract is in force with the Central Guanica and Central Romana (Sugar Refining) Companies, dated December 19th, 1913. This lays down the conditions under which the two companies conduct for the Dominican Government Public Radiotelegraphic Service through the medium of their stations.

Clause I deals with the rates per word for foreign messages, which for the general public amounts to 30 cents per word.

Clause II deals with radio rates in the island—8 cents per word.

Clause III deals with special rates for officials of the States and the two companies, press rates, etc.

Clauses IV, V, and VI deal with matters and methods of accounting.

ECUADOR

(See maps 48 and 50.)

THE Republic of Ecuador is administered by a President, and the legislative power is controlled by a Congress of two Houses comprising thirty-two Senators and forty-eight Deputies respectively.

CONTROL AND ORGANISATION.

On the 1st March, 1920, the Government decreed the official monopoly of wireless communications in the territory of the Republic, and on the 17th April of the same year Ecuador adhered to the International Radiotelegraphic Convention of London, 1912.

The organisation and everything concerning wireless telegraphy and telephony is under the Direction of the Minister of the Interior, assisted by the Director-General of Telegraphs.

Officers and men in the Guayaquil artillery school are put through a comprehensive course in radiotelegraphy with the aid of laboratory apparatus.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Señor Don Guillermo Destrugue	Director-General of Telegraphs	Quito
Dr. Pio Taramillo Alvarado ..	Minister of the Interior	Quito

There are at present five radiotelegraph stations, one at Quito, the capital of the Republic, and four coast stations, at Guayaquil, the principal port, Esmeraldas, Machala, and Puna Guayas.

The stations at Quito and Guayaquil are intended to ensure the more efficient communication between those two towns and to correspond with the station of Esmeraldas. The stations at Guayaquil, Esmeraldas and Puna Guayas also correspond with ships.

Communication is projected between the Galapagos Islands and the continent.

The stations of Quito and Guayaquil have been designed to maintain an efficient and permanent service, notwithstanding the difficulties of territory and atmosphere; these questions are of great importance in view of the

geographical position of the country. As the traffic develops small stations will be established in towns of lesser importance.

The question of wireless telegraphy in Ecuador is receiving consideration from the technical and economical points of view and on March 28th, 1921, a contract was signed with the Compagnie Générale de T.S.F. for the installation of nine wireless stations, including one for inter-continental service.

EGYPT.

(See Maps 25, 27, and 29)

EGYPT was given independence in March, 1922, with Fuad I as King.

CONTROL.

Wireless Telegraphy forms a branch of the Ministry of Communications and is controlled by the State Telegraph Department of that Ministry.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Mr. H. Mayne	Acting Inspector-General of Telegraphs and Telephones.	Cairo.
Mr. W. J. Hilyer, B.Sc., M.I.E.E., A.M.I.C.E.	Chief Engineer of Telegraphs and Telephones.	Cairo.
Mr. H. E. Watterson, F.Inst. Rad. Eng., M.I.E.E.	Wireless Engineer	Cairo.
Mr. L. G. Farthing	Wireless Superintendent	Ras el Tin, Alexandria.

ADMINISTRATION.

Wireless Telegraphy is a State monopoly in accordance with the Khedival Decree, dated May 12th, 1906; the Administration has now been transferred to the Ministry of Communications.

The Laws and Regulations governing Wireless in Egypt, are :—

A—Khedival Decree (Law No. 4, of 1906).

B—Authority for the use of Receiving Apparatus.

C—Licence for use of Receiving Apparatus.

KHEDIVAL DECREE, DATED MAY 12TH, 1906.

A 1. Wireless Telegraphy shall be a State monopoly, and no installation shall be established or used except by the Government or with the sanction of the Government.

2. The Minister of Public Works shall be responsible for the administration of this Law.

EXPERIMENTS IN WIRELESS TELEGRAPHY.

B 1. Under the Khedival Decree, dated May 12th, 1906, Wireless Telegraphy in Egypt is a State monopoly, and the authority of the Minister of Communications is necessary before any apparatus for wireless telegraphy is installed or worked.

AUTHORITY FOR THE USE OF RECEIVING APPARATUS, CONDITIONS OF ISSUE, ETC.

2. Formal licences to conduct experiments in wireless telegraphy cannot at present be granted, but the Minister of Communications is prepared to authorise the use of wireless apparatus for the reception of signals on the following conditions :—

3. The applicant shall produce evidence of nationality and two written references as to the applicant's character. Such references should be given by persons of standing who are not related to applicant.

4. There shall be no divulgence to any person other than properly authorised officials of the

Egyptian Government or a competent judicial authority or any use whatever made of any message received by means of the apparatus.

5. The installation shall be subject to the approval of the Ministry of Communications.

6. The aerial wire shall not exceed the under-mentioned maximum height and dimensions :—
Extreme height of aerial above ground, 30 metres.

Total length of wire including leading-in wires: 30 metres for single wire aerial; 42 metres of wire where two or more wires are used (*e.g.*, total length 21 metres of double wire).

7. Valves shall not be used without the special authority of the Minister of Communications.

8. The apparatus shall be open to inspection at all reasonable times by properly authorised officials of the Egyptian Government.

9. An annual fee of P.T.50 shall be paid in respect of each experimental receiving licence to cover the expenses of the issue of the licence and the inspection of the station.

10. Authority to use wireless telegraph apparatus cannot be issued to a person under 21 years of age. Application should accordingly be made on his behalf by a parent or guardian, who should proceed as indicated above and should state his (or her) relationship to the applicant. In such cases the evidence and references specified in condition (3) should be

furnished BOTH AS REGARDS THE APPLICANT AND HIS PARENT OR GUARDIAN, and the latter will be personally responsible for the carrying out of the conditions of the licence.

11. The applicant should furnish (by letter addressed to the Egyptian State Telegraphs) :—

(a) A formal acceptance of the conditions of this licence, copy of which will be delivered to him against receipt.

(b) Evidence and references described in (3).

(c) His full name, age, and particulars of his occupation.

(d) A remittance of P.T.50.

(e) A description of the apparatus which it is proposed to install, and if authority is desired for the use of valves, a diagram of the circuit in which they would be used.

(f) A sketch showing the form, height and dimensions of the proposed aerial wires (including leading-in wires).

(g) The address at which the apparatus would be installed.

12. This licence is temporary and is subject to cancellation by an order of the Minister in case of breach of any of the conditions above mentioned, or at the discretion of the Minister if he deems it necessary in the general interest.

Date

Signature of H.E. THE MINISTER.

Signature of the licensee.

(and his parent or guardian, if any).

EGYPTIAN STATE TELEGRAPHS.

LICENCE FOR WIRELESS TELEGRAPHY RECEIVING APPARATUS.

Whereas by Law No. 4 of 1906, Wireless Telegraphy in Egypt was constituted a monopoly of the State and it is forbidden to set up or work apparatus for Wireless Telegraphy without the licence of the Egyptian Government;

This is to certify that..... is authorised, until further notice only, to set up and work an experimental wireless apparatus for the sole purpose of the reception of signals at..... upon the following conditions:

1. The apparatus shall correspond exactly to the description and design as approved by

the Inspector General of Telegraphs and annexed to this licence.

2. Valve receivers may not be used except by special permission accorded by the Inspector General of Telegraphs by approval given to the designs thereof annexed to this licence.

3. The aerial wires shall not be placed at a height exceeding 30 metres above the ground level at the site of the installation.

4. The total length of the aerials, including leading-in wires, shall not exceed :—

(a) 30 metres of wire where the aerial wire is single.

(b) 42 metres where two or more aerial wires are used.

5. No substantial alteration in the apparatus as authorised shall be made without the previous approval of the Inspector General of Telegraphs.

6. The apparatus shall be open to inspection at all reasonable hours by properly authorised officials of the Egyptian Government.

7. The Licensee shall pay to the Inspector-General of Telegraphs, on the issue of this licence, a fee of P.T. 50, and on the..... of every year thereafter a similar fee so long as this licence shall remain in force.

8. The licensee shall not divulge or cause or permit to be divulged to any person, other than an official of the Egyptian Government duly authorised in that respect or a judicial authority legally empowered to require such divulgence, any message received by means of the licensed apparatus, and he shall not make or cause or permit to be made any other use whatever of any such message.

9. This licence is subject to cancellation, at any time, by order of the Minister of Communications, in the event of the breach of any of the above conditions, or at the discretion of the said Minister if he shall deem such cancellation necessary in the public interest.

The licensee shall, in neither of such cases have any claim to indemnity or to the return of any fee paid or of any part thereof, and in case of breach of any of the conditions of the licence he shall be liable to pay a fine not exceeding L.E. 100 (one hundred), which will be imposed by the Minister.

Date

Minister of Communications.

ESTHONIA

(See Maps 3 and 12)

CONTROL.

EXCEPT for military and naval stations, the control of wireless telegraphy and telephony is effected by the following principal officials, assisted by the Committee of Wireless Telegraphy and Telephony:

Official.	Title.	Address.
Karl Kark ..	Minister of Ways and Communications ..	Tallinn.
Gustav Jallajas ..	Director-General of Posts, Telegraphs and Telephones ..	Tallinn.
Paul Etruk ..	Chief Engineer of the General Post Office ..	Tallinn.

GENERAL INFORMATION.

The 10 kW. land station at Haapsalu is worked directly from the telegraph office at Tallinn, and is used for direct duplex communications with Denmark, Great Britain and Germany. The station also transmits regular meteorological reports. A special station will shortly be established by the General Post Office for broadcasting purposes.

Licences have been issued for a small number of private persons and societies to establish and operate broadcasting apparatus for reception only. There are no direction-finding stations nor transmissions of time and press signals.

The International Radiotelegraphic Convention, 1912, was ratified by Esthonia in 1923. There are no special laws and regulations concerning wireless telegraphy. The form of licence at present issued for broadcast reception is as follows :—

“To the Postmaster-General.

Obligation concerning the establishment of a wireless receiver apparatus.

1. The wavelengths of the apparatus cannot exceed 700 metres.

2. The apparatus cannot emit waves of its own.

3. The licensee pledges himself to act in conformity with the laws and regulations

concerning Telegraphy, Telephony and Radio in force at present or to be issued in future.

4. The licensee pledges himself not to overhear the working of postal and military wireless stations; if, however, the hearing of such communications cannot be avoided he is not authorised to write them down, to publish them, or to make any use of the information.

5. The licensee shall advise the General Post Office of the establishment of the apparatus, in order that the receiving station may be duly registered and inspected.

6. The type of the apparatus to be established is , and its wavelength of reception is metres.

Signature.

FALKLAND ISLANDS

(See Maps 49, 52 and 53.)

THIS is a Crown Colony situated in the South Atlantic, 300 miles east of the Magellan Straits.

The Administration is conducted by the Governor, assisted, by an Executive Council and a Legislative Council.

CONTROL.

Wireless telegraphy is under the supervision of the Post Office.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. Craigie-Halkett	Postmaster.. .. .	Stanley
Mr. A. R. Lash	Engineer-Operator-in-charge ..	Stanley

ORGANISATION.

There are two wireless stations, one at Stanley Harbour, East Falkland, the other at Fox Bay, on the East Coast of the West Island. Both are owned by the Colonial Government and worked under the supervision of the Colonial Postmaster.

Having no cable, all telegraphic business with the outside world is carried out by means of wireless. Stanley has regular routines with Monte Video and Punta Arenas.

A valve transmitting station intended for communicating with Stanley, Monte Video and ships, is in the course of erection in the South Georgia Dependency.

It is proposed to instal C.W. apparatus at the Stanley Station in the near future.

ADMINISTRATION.

Radiotelegraphy is administered under the following Acts :—

A—Wireless Ordinance.

B—Wireless Telegraphy Regulations.

WIRELESS ORDINANCE.

DATED MARCH 15TH, 1912.

A The following Ordinance relating to wireless telegraphy came into force on March 15th, 1912 :—

No person shall establish any wireless telegraph station or install or work any appa-

ratus for wireless telegraphy in any place or on board any British ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor in Council.

2. No person shall work any apparatus for wireless telegraphy installed on any merchant

ship (whether British or foreign), whilst that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations made in that behalf by the Governor in Council, and the Governor in Council may, by any such regulations, impose penalties, recoverable before a Stipendiary Magistrate or any two Justices of the Peace in a summary manner, for the breach of any such regulations, not exceeding twenty pounds for each offence, and may provide for the forfeiture of any such breach of any apparatus for wireless telegraphy installed or worked on such ship.

3. If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be guilty of a misdemeanour and be liable on summary conviction thereof to a penalty not exceeding twenty pounds or to imprisonment not exceeding three months and, on conviction in the Supreme Court, to a fine not exceeding one hundred pounds, or to imprisonment for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence.

4. If a Justice of the Peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship within his jurisdiction without a licence in that behalf or contrary to the provisions of the regulations made under this Ordinance, he may grant a search warrant to any constable or to any officer appointed in that behalf by the Governor and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place, or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy.

5. The expression "wireless telegraphy" means any communication by telegraphy without the aid of any wire connecting the points from and at which the messages or other communications are sent and received; Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery for any purpose other than the transmission of messages.

6. The Wireless Telegraph Ordinance, 1903, is hereby repealed.

7. This Ordinance may be cited as the Wireless Telegraph Ordinance, 1912.

WIRELESS TELEGRAPHY REGULATIONS.

B In pursuance of the powers in him vested by section 2 of the "Wireless Telegraphy Ordinance, 1912," His Excellency the Governor, by and with the advice of the Executive Council, is pleased to make the following Regulations:—

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of this Colony shall be worked in such a way as not to interfere with (a) Naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the Colony, except with the special or general permission in writing of the Governor.

3. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

4. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases as may be deemed desirable.

5. The master of any merchant ship on board of which apparatus for wireless telegraphy shall be worked or used contrary to these Regulations shall on summary conviction before a stipendiary magistrate or any two justices of the peace be liable to a penalty not exceeding twenty pounds for each offence and to the forfeiture of any apparatus for wireless telegraphy installed on such ship and in default of payment to be imprisoned with or without hard labour for a period not exceeding three months.

6. These Regulations shall come into force on the first day of September, 1912.

Dated at Government House, Stanley, this 21st day of June, 1912.

By Command,

T. A. V. BEST,
Colonial Secretary.

FEDERATED MALAY STATES

(See Maps 17 and 22)

Including ; Perak, Selangor, Negri Sembilan, and Pahang.

THE Federated Malay States are under British protection.

ADMINISTRATION.

Wireless telegraphy is regulated by:—

A—Enactment No. 7 of 1913, and

B—Rules under the above Enactment.

The text of both the enactment and the rules made under its provisions will be found below.

ENACTMENT NO. 7 OF 1913.

An Enactment to make better provision for the regulation of Wireless Telegraphy.

A

July 30th, 1913.

It is hereby enacted by the Rulers of the Federated Malay States in Council as follows:—

1. (1) This enactment may be cited as "The Wireless Telegraphy Enactment, 1913," and shall come into force upon the publication thereof in the *Gazette*.

(2) The Enactments specified in the schedule are amended by deleting from the interpretation of "Telegraph" in section 2 of each of the said Enactments the words "whether worked with or without lines of wires."

2. (1) In this Enactment the expression "wireless telegraphy" means any system of communication by telegraph as defined by "The Telegraphs Enactments, 1905," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received;

The expression "locally owned ship" means a ship owned wholly by the Government of the Federated Malay States or of any of them or by subjects of any of the rulers of the said States or by bodies corporate established under and subject to the laws of the said States or of any of them and having their principal place of business within the said States or by any person residing within the said States.

(2) Nothing in this Enactment shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Chief Secretary to Government may, whenever he shall deem it expedient to do so, licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Federated Malay States or on board any locally owned ship.

4. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Federated Malay States or on board any locally owned ship except under and in accordance with a licence granted in that behalf by the Chief Secretary to Government.

(2) Every such licence shall be in such form and for such period as the Chief Secretary to Government may determine and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as the Chief Secretary to Government shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Enactment except with the previous sanction of the Public Prosecutor.

(2) If a Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in

any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Chief Secretary to Government may make rules for all or any of the following matters:—

(a) For prescribing the form and manner in which applications for licences under this Enactment are to be made;

(b) For prescribing the fees payable on the grant of any licence;

(c) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, in the waters of the Federated Malay States shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the Federated Malay States or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) For prohibiting except with the special or general permission of the Director of Posts and Telegraphs, Federated Malay States, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, whilst such ship is in any of the harbours of the Federated Malay States.

(e) For prohibiting or regulating, in case at any time in the opinion of the Chief Secretary to Government an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether locally owned ships, British or foreign ships, in the waters of the Federated Malay States, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Chief Secretary to Government may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) No rules made in respect of the matters described in paragraphs (c), (d) and (e) of sub-section (1) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the Chief Secretary to Government that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Chief Secretary to Government may think proper, but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Enactment or of any rule made thereunder or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Enactment and for every such offence not

otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(2) All convictions, forfeitures and fines under this Enactment or any rules made thereunder may be had and recovered before the Court of a Magistrate of the First Class.

SCHEDULE.

State.	No. and year.	Short title.
Perak ..	6 of 1905	The Telegraphs Enactment, 1905
Selangor ..	9 "	" "
Negri Sembilan ..	7 "	" "
Pahang ..	8 "	" "

RULES.

UNDER "THE WIRELESS TELEGRAPHY ENACTMENT, 1913."

B In exercise of the powers vested in him by section 6 of "The Wireless Telegraphy Enactment, 1913," the Chief Secretary to Government has made the following rules:—

1. All apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, in the waters of the Federated Malay States shall be worked in such a way as not to interfere with (a) naval signalling or (b) the working of any

wireless telegraph station lawfully established, installed or worked in the Federated Malay States or the waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, shall be worked or used whilst such ship is in any of the harbours of the Federated Malay States, except with the special or general permission of the Director of Posts and Telegraphs, Federated Malay States.

3. If at any time, in the opinion of the Chief Secretary to Government, an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships, whether locally owned ships, British or foreign ships, while in the waters of the Federated Malay States shall be subject to such further rules as may be made by the Chief Secretary to Government from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. Expressions defined in "The Wireless Telegraphy Enactment, 1913," have in these rules the meanings thereby assigned to them.

FIJI ISLANDS.

(See Maps 55 and 56)

THE administration is that of a British Crown Colony, the Governor being assisted by an Executive Council of six and a Legislative Council of twenty members.

CONTROL.

The four wireless telegraph stations in Fiji are owned and worked by the Colonial Government through the Department of Posts and Telegraphs.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
H. P. St. Julian	Colonial Postmaster	Suva

Stations. Suva radio, Labasa radio, Taviuni radio, and Savusavu radio.

The colony possesses no wireless clubs or societies.

Weather reports are sent out daily.

There are no stations existing or projected for aviation or meteorological purposes.

ORGANISATION.

The first Wireless Telegraph Ordinance was passed in 1903. This was revoked by Ordinance No. XXV of 1912 (printed in the YEAR BOOK for 1917), which was in turn revoked by Ordinance V of 1913. New regulations were

made in 1917, which have since been revoked, and the original regulations made in 1913 are now in force.

ADMINISTRATION.

The following pages contain the text of:—

- A—Ordinance No. V of 1913.
- B—Schedule based thereon.
- C—Form of Experiment Licence.
- D—Form of Ship Licence.

AN ORDINANCE TO PROVIDE FOR THE REGULATION OF WIRELESS TELEGRAPHY.

Dated June 19th, 1913.

A Be it enacted by the Governor with the advice and consent of the Legislative Council as follows:—

1. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1913.

2. In this Ordinance "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under or in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such purpose as the Governor may determine and shall contain the terms, conditions and restrictions on any subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship whether British or foreign while that ship is in the territorial waters of the Colony otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this ordinance and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a stipendiary magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf or contrary to

the provisions of any regulations made under this Ordinance or of any licence granted under this Ordinance he may grant a search warrant to any officer of constabulary or any person appointed in that behalf by the Inspector-General of Constabulary and named in the warrant and a warrant so granted shall authorise the officer of constabulary or person named therein to enter and inspect the station place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds and upon such conviction the court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before a stipendiary magistrate on the complaint of the Inspector-General of Constabulary or of any person thereto authorised by him in writing and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphy Ordinance 1912 is hereby repealed.

Passed in Council this 'twenty-sixth day of May in the year of our Lord one thousand nine hundred and thirteen.

SCHEDULE.

REGULATIONS.

B (i) All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the colony shall be worked in such a way as not to interfere with:—

(a) Naval signalling; or

(b) The working of any wireless telegraph station lawfully established installed or worked in the Colony or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(ii) In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station whether on shore or on any ship.

(iii) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

(iv) For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(v) Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

(vi) These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

LICENCE TO USE WIRELESS TELEGRAPHY FOR EXPERIMENTAL PURPOSES, GRANTED BY THE GOVERNOR IN PURSUANCE OF SECTION 3 OF ORDINANCE NO. V OF 1913.

Governor.

C Licence is hereby granted to (hereinafter called the licensee), subject to the conditions hereinafter contained, during the term or period commencing on the day of 192.... and terminating on

(i) To establish, install and work at the station specified in the Schedules hereto apparatus for wireless telegraphy and telephony (hereinafter called "the licensed apparatus") provided that the apparatus installed at such station shall be of the character specified in the said Schedules opposite to the name of such station; and

(ii) To transmit and receive messages by means of wireless telegraphy and telephony at the said station:

Provided that the licensed apparatus shall be worked and the messages shall be transmitted and received solely for the purpose of conducting experiments in wireless telegraphy and telephony and for no other purpose whatever.

2. The licensed apparatus shall not be used by the licensee or by any other person either on his behalf or his permission for any purpose except for the purpose of conducting experiments in wireless telegraphy and telephony.

3. (1) The licensed apparatus shall be so worked as not to interfere with the working of any wireless telegraph station established in the Colony of Fiji or the territorial waters abutting on the coasts of the Fiji Islands by or for the purpose of the Government of Fiji or any department of His Majesty's Government or for and in particular with the transmission or receipt of any message between or at wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the Licensee and any person acting on his behalf or by his permission shall comply with all directions which shall be given to the licensee by the Colonial Secretary or prescribed by the Colonial Secretary with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not without the consent in writing of the Colonial Secretary be altered in respect of any of the particulars mentioned in the Schedule hereto.

(4) The Licensee shall at all times indemnify the Government against all actions claims and demands which may be brought or made by any corporation company or person in respect of any

injury arising from any act licensed or permitted by these presents.

4. The licensee shall pay to the Colonial Treasurer for and in respect of the licence hereby granted a royalty of _____ per annum in respect of each station at which the licensed apparatus is installed.

5. (1) The licensee shall not (either by himself or by any person acting on his behalf or by his permission) by the use of the licensed apparatus interfere with naval signalling.

(2) Whenever the operators at any of the said stations of the licensee perceive through the medium of the instruments used by them that naval signalling is proceeding they shall refrain from using the licensed apparatus until all indication that naval signalling is proceeding shall have ceased.

(3) The licensee and any person acting on his behalf or by his permission shall if so required in writing by the Colonial Secretary cease to use the licensed apparatus for such period (not exceeding _____ hours in any one day) as may be specified by the Admiralty.

(4) If the Governor is of opinion that the working of the licensed apparatus at any station specified in the schedule hereto is inconsistent with the free use of naval signalling the licensee shall, when required in writing by the Colonial Secretary, close the said station.

(5) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this indenture.

6. Neither the licensee nor any person on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid and transmitted by naval signalling or by any system of wireless telegraphy and telephony provided or maintained by or for the purposes of the Government of Fiji, any other Administration or by any licensee of the Colonial Secretary (other than the licensee).

7. The Colonial Postmaster and his engineers, agents and assistants, may from time to time and at all reasonable times enter upon all or any of the stations or other premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such places respectively for the purpose of transmitting and receiving messages by wireless telegraphy and telephony and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and use of such apparatus and telegraphic instruments respectively and the licensee shall afford all requisite and proper facilities for such inspection and shall secure to the Colonial Postmaster the right for the purpose aforesaid of entry from time to time and on such of the said stations and premises as may be in the possession or occupation of any person or persons other than the licensee.

8. (1) All apparatus used or intended to be used under this licence shall be so erected, fixed, placed and used, as not either directly or by reason of the working or use thereof to interfere with the efficient or convenient maintenance, working or use, of any telegraphic line of the Government which may from time to time exist or which it is probable that the Government may have occasion to erect, place, fix or use or to expose any such line to risk of damage or to

(ii). To send and receive messages by means of the licensed apparatus between the said ship stations and also between the said ship stations and coast stations and other ship stations.

Provided that the licensee shall not except with my consent in writing send or receive messages from and at the said ship stations when in any of the harbours of the Colony; and

(iii) To receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there shall be something either in the subject or context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The term "telegraph" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The expression "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

The expressions "the International Telegraph Convention" and "the International Telegraph Regulations" mean respectively the International Convention of St. Petersburg, dated the 10th, 22nd July, 1875, and the Service Regulations made thereunder and include respectively any modifications of the Convention or regulations made from time to time.

The expression "the Radiotelegraphic Convention, 1912," means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which has been established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf of or by permission of the licensee for the transmission or receipt of messages except messages authorised by this licence.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling.

(2) The provisions for the protection of Naval signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Wireless Telegraphy Ordinance, 1913, by the Governor in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraphic Convention, 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Governor from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not without the consent of the Governor be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

9. The licensee shall at all times indemnify the Governor against all actions claims and demands which may be brought or made by any corporation company or person in respect of any injury arising from any act licensed or permitted by these presents.

10. (1) Subject to the provisions of this licence the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge, order of transmission or otherwise. Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

11. The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

12. (1) The licensed apparatus at each of the ship stations mentioned in the Schedule hereto shall be worked only by operators holding certificates issued by the Governor or the Postmaster-General of the United Kingdom or the Government of any self-governing Dominion and the licensee shall provide for the working of each station such operators as are required by the provisions of Article X of the Service Regulations annexed to the Radiotelegraphic Convention, 1912, according to the class of the ship station and shall observe the regulations as to the working of the ship station laid down according to its class by Article XIII of the said Regulations.

(2) A certificate shall not be recognised as authorising the holder to work a ship station under the terms of this licence unless it bears a statement that it is issued by the Governor or the Postmaster-General of the United Kingdom or the Government of any self-governing Dominion in accordance with the Radiotelegraphic Convention, 1912. Such certificates will be valid only during the operation of the said Convention. When issued by the Governor such certificates will be granted to persons of such technical pro-

iciency and will be in such form and will be subject to such conditions as the Governor shall from time to time prescribe and they may be by whomsoever issued, endorsed or withdrawn at the discretion of the Governor in case of misconduct or breach on the part of the holder of the regulations prescribed for the working of ship stations.

13. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the ship stations specified in the Schedule hereto a copy of section 11 of the Post Office (Protection) Act, 1884, and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of the licence entitling the Governor under Clause 22 hereof to revoke and determine this licence.

14. The licensee shall keep full account of records and registers of all messages transmitted by means of the licensed apparatus and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination and such further particulars as the Governor shall from time to time reasonably require to be shown; messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for a period of at least fifteen months counting from the month following that in which the radiotelegrams were handed in as prescribed by the Radiotelegraphic Convention, 1912, and such registers and message papers shall be open to the inspection of the Governor or his officers thereto authorised at the office of the licensee in Fiji or at such other place as may be agreed between the hours of 10 a.m. and 5 p.m., on every day except Sunday or a general or public holiday.

15. The licensee shall render to the Governor such accounts as the Governor shall direct in respect of all charges, if any, due or payable under the Radiotelegraphic Convention, 1912, in respect of messages exchanged between the ship stations hereby licensed and coast stations and shall pay to the Colonial Treasurer at such times and in such manner as the Governor shall direct all sums which shall be due from the licensee under such accounts.

16. The Governor and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the ship stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instrument respectively.

17. The licensee shall carry on every ship on which a ship station is established under this licence a print or copy of the licence certified under the hand of the Colonial Secretary of the Colony of Fiji or appropriate officer of the Postmaster-General of the United Kingdom or of the Government of any self-governing Dominion to be a true copy and shall produce

such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls. The licensee shall also carry on every such ship such documents as may be prescribed by the Governor for the purpose of enabling the licensee to communicate with coast stations and ship stations in accordance with the Radiotelegraphic Convention, 1912.

18. (1) The licensee shall pay to the Colonial Treasurer for and in respect of the licence hereby granted a royalty of 10s. per annum in respect of each ship station at which the licensed apparatus is installed.

(2) The said royalty shall be payable on the 1st January in each year during which the licence remains valid.

19. Except with the consent in writing of the Governor the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licences, powers or authorities hereby granted or any of such licences, powers or authorities.

20. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval, Military, Customs or Police officer or any other person authorised by the Governor to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any officer or person so authorised may enter upon any ship on which such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent the use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised may in such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may enter upon any ship on which any apparatus is installed accordingly or the said officer or person so authorised may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

21. At any time after the day of 19, the Governor may in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby granted at the end of one calendar month from the date of such notice

and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Governor under any condition or provision herein contained.

22. In any of the following cases (that is to say) :—

(a) In case any sum of money which ought to be paid by the licensee to the Colonial Treasury under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or,

(b) In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained;

then and in any such case the Governor may by notice in writing under his seal revoke and determine these presents and the licences, powers and authorities hereinbefore granted and each and every of them as to all or any of the ship stations hereby licensed and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said ship stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Governor under any condition or provision herein contained.

23. Nothing in these presents contained shall prejudice or affect the right of the Governor from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect

the right of the Governor from time to time to enter into agreements for or to grant licences relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the Colony by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor or any other person by or under any Imperial or local enactment or by or under any agreement relating to the transmission of messages by ordinary land and submarine telegraphy.

24. Any notice request or consent (whether expressed in writing or not) to be given by the Governor under these presents may be under the hand of the Colonial Secretary of the Colony of Fiji and may be served by sending the same in a registered letter addressed to the licensee at the usual or last known place of residence or business of the licensee or if such notice request or consent relates to any particular ship station by delivery to the master of the ship upon which such station is installed and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Colonial Secretary of the Colony of Fiji.

As witness my hand and seal this
day of.....
one thousand nine hundred and.....

By Command,

Colonial Secretary.

Signed, Sealed and Delivered by.....
in the presence of.....

FINLAND

(See Maps 3, 9 and 12)

CONTROL AND ORGANISATION.

THE Government possess the sole right to erect and use wireless telegraph and telephone systems on Finnish Territory. Private persons may erect and use wireless telegraph and telephone appliance on land, ships and aircraft, subject to obtaining permission from the Ministry for Communications and Public Works. The systems now in use are under the administration of the War Ministry.

The wireless service is worked by the Army while the clearing is in the care of the Telegraph Administration.

The Ministry for Communications and Public Works grants licences for broadcast reception. There are at present some experimental broadcasting stations operated by amateur societies.

ADMINISTRATION.

Wireless communications are carried out in accordance with the International Radiotelegraph Convention of 1912.

The following Laws have been passed regarding the construction and use of wireless telegraph and telephone systems :—

- A**—Law respecting Electric Plants for Wireless Telegraphy and Telephony.
- B**—Order in Council concerning the use of Wireless Telegraphy on board Foreign Ships.
- C**—Charges for Wireless Communications.

LAW

RESPECTING ELECTRIC PLANTS FOR
WIRELESS TELEGRAPHY AND
TELEPHONY.**A**

Given in Helsingfors, December 23rd, 1919.

1. The Government has the sole right on the territory of the State to erect and use electric plants for wireless telegraphy and telephony.

2. Private persons may, however, also, by special permission, erect and use such plants as mentioned in the preceding paragraph, subject to the regulations set out hereinafter.

3. A person who wishes to erect such plants as mentioned in Art. 1 on land, stationary ship, movable ship or aircraft, shall apply for the necessary permission to the Ministry for Communications and Public Works.

4. The permission mentioned in Art. 3 shall be granted in accordance with the general principles laid down by the Council of State for a limited period in no case exceeding ten years.

5. The Council of State shall sanction the regulations required for the use of the systems, which this law refers to, in foreign ships moving in Finnish territorial waters.

6. Any person who erects or uses a system to which this law refers, without having obtained the required permission, shall be fined by penalty of 500—10,000 Finnish marks, with the forfeiture of the system at the same time, except in cases where the act is of such a nature that the criminal law prescribes a more severe punishment.

Should the system not have been constructed in accordance with the regulations laid down for the granting of the permission, or should the regulations in any other way be infringed, a fine not exceeding 1,000 Finnish marks shall be imposed, unless the criminal law prescribes a more severe punishment.

Should a system be constructed without the required permission, or against the regulations issued at the time of the granting of the permission or should the regulations in any way be infringed, it is the duty of the Governor of the Province concerned to take immediate steps for the prevention of the use of such a system. The instructions given by the Governor in the matter must be complied with, notwithstanding appeals, until otherwise is decided.

7. If sentence shall have been passed in accordance with Art. 6, para. 2, the Ministry for Communications and Public Works shall have the right to withdraw the permission granted.

8. The provisions made in the criminal law, Chapter 40, Section 15, for the protection of telegram correspondence and telegram immunity shall also apply to information transmitted through the systems referred to in this law.

What, in the said section, is stipulated about telegraph officials shall also apply to persons employed in the privately owned telegraph and telephone stations established by virtue of this law.

9. The provisions of the Criminal Law, Chapter 34 Section 12, and Chapter 35 Section 1, concerning prevention of or interference with the work of telegraph and telephone stations, or the causing of damage to telegraph or telephone, shall also apply, where possible, to such systems as this law refers to.

To be observed by all whom this law may concern.

Helsingfors, December 23rd, 1919.

K. J. STAHLBERG,
President of the Republic.

SANTERI POHJANPALO,
Minister for Communications and Public Works.

ORDER IN STATE COUNCIL.

B Concerning the use of wireless telegraph and telephone systems on board foreign ships when moving in Finnish territorial waters.

Given in Helsingfors, September 29th, 1921.

By virtue of the law concerning electric plants for wireless telegraphy and telephony, given December 23rd, 1919, the Council of State has issued the following Order:—

1. Electric systems for wireless telegraphy and telephony on board foreign ships, not stationary in Finnish territorial waters, may be used in a Finnish harbour only by special permission granted by the Telegraph Administration after consultation with the Chief of Staff for Coastal Defence, and subject to the regulations laid down by the Telegraph Administration.

Neither may the systems mentioned in the preceding clause be used on board foreign ships in Finnish territorial waters within less than ten (10) nautical miles' distance off a Finnish coastal station, except in cases of distress or when required for telegraphic communications with the nearest situated coastal station.

The Telegraph Administration shall have the right, after consultation with the Chief of Staff for Coastal Defence, to prohibit or limit the use of telegraph or telephone systems on board foreign ships, except in cases of distress, also when in other parts of Finnish territorial waters than those mentioned.

2. The Telegraph Administration shall have the right to issue instructions for the prevention of the use of Wireless telegraph and telephone systems on board foreign ships within such territory where the use of such systems in accordance with Art. 1 is prohibited.

3. It shall be the duty of the Telegraph Administration to publish in a suitable way for the information of seafaring people, either once for all or for certain periods or certain cases, regulations and instructions issued in pursuance to Art. 1, para 9, and Art. 2. The Mercantile Marine Board, the Customs authorities, and the Governors of the Provinces concerned, shall, through their subordinates, supervise the observance of the regulations and instructions thus issued.

4. When wireless telegraph and telephone systems are used on board foreign ships sailing in Finnish territorial waters, the regulations in force, contained in the International Wireless Telegraph Convention and Service Instructions pertaining thereto, shall be observed where applicable, except in cases for which otherwise is stipulated.

5. Infringement of these regulations, or of any regulations issued by the Telegraph Administration by virtue of this Order, shall be punished with fines of 500—5,000 Finnish marks.

6. Legal actions for infringements, as mentioned in Art. 5, shall be brought before the town court of the nearest town.

7. The provisions laid down in Arts. 5 and 6 do not apply to warships.

To be observed by all whom this Order may concern.

Helsingfors, September 29th, 1921.

ERKKI PULLINEN,
*Minister for Communications
and Public Works.*
K. R. SALOVIUS.

C The President of the Republic has fixed the following charges for wireless communications temporarily conducted in accordance with the Order in State Council:

1. For communications exchanged between

the Finnish mainland and Finnish vessels, and *vice versa*.

A charge per word, which shall include the coast or wireless telegraphic charge of 30 centimes and the ship's charge of 15 centimes per word, as well as the charge for each word paid for telegraphic communications by wire. The rate of exchange chargeable for the centime shall be that charged in each case for telegraphic communications by wire with foreign countries. The minimum fee for telegrams

transmitted through wireless telegraph, including the wire charge, is 12 Finnish marks.

2. For other wireless communications :

The same charge, as stipulated by International Regulations, and when necessary also including the charges for telegraphic communications by wire.

The coast charges will be collected from foreigners in accordance with International Regulations.

There are at present 19 Finnish passenger and merchant ships equipped with wireless.

FRANCE AND ALGERIA.

(See Maps 2 and 7)

Including : Andorra and Corsica.

CONTROL.

RADIOTELEGRAPHY in France is a State monopoly. The commercial use of wireless telegraphy in France and Algeria has been placed under the control of the Minister of Posts and Telegraphs. The Department of Telegraphs deals with all matters relating to the administration of commercial wireless telegraphy, and also controls inland and foreign telegraphs. The Ministry of War and the Ministry of Marine control the use of wireless telegraphy in the Army and Navy respectively.

The high power radiotelegraph stations of France operated by different Government Departments are :—

Eiffel Tower	..	..	Ministry of War.
St. Pierre des Corps	..	..	do.
Basse-Lande (Nantes)	..	..	Ministry of Marine.

La Doua (Lyons)	..
Bordeaux-Lafayette (Croix d'Hins)	

These two stations, erected by the War Department, are worked by the Administration of Posts and Telegraphs, for Public Service, principally for communication with the stations of the French Inter-Colonial districts.

The high power wireless stations of France operated by private Companies, under the control of the Government are :

Sainte Assise transcontinental—operated by La Cîè Radio France.
Sainte Assise continental—operated by La Cîè Radio France.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
M. le Capt. de Vaisseau Lagorio ..	Directeur du Service de la Télégraphie sans Fil	5 rue Froidevaux Paris (14 ème)
M. Lahaye	Ingénieur au Service de la Télégraphie sans Fil	do.
M. Hamel	do.	do.
M. le Corbeiller	do.	do.
M. Veaux	do.	do.

ADMINISTRATION.

Licences for the erection and maintenance of ship stations are issued to steamship companies. The form of such licences and the contract indicating the conditions under which is accorded authorisation to install wireless telegraphy on board ships will be found below.

The administration of radiotelegraphy is governed by the following enactments, supplemented by a Form of Ship's Licence :—

A—Decree, dated March 5th, 1907 (modified by subsequent enactments). (General and Executive).

- B**—Decree, dated February 25th, 1917. (Transmission and reception of signals.)
- C**—Decree, dated December 15th, 1917 (modified by Decrees of May 15th, 1919, and March 21st, 1920). (Parliamentary Committee.)
- D**—Form of Ship's licence.
- E**—Decree of July 31st, 1919. (Special Commission for Controlling Non-Military Stations.)
- F**—Decree of August 9th, 1920. (Aerial Navigation.)
- G**—Decree of August 26th, 1920. (Charges for D.F. Messages.)
- H**—Decree of May 15th, 1921, modifying Article 3 and 4 of the Decree of February 24th, 1917.
- I**—Decree of June 2nd, 1920, relative to the establishment of private wireless communications.
- J**—Decree of June 18th, 1921, Licences for experimental, etc., stations.
- K**—Administrative Order of December 30th, 1922, relating to Receiving Stations.
- L**—Decree dated April 6th, 1923, relating to Wireless Telegraphy on Ships.
- M**—Decree of November 10th, 1923. (Regulating Wireless Telegraphy on Ships.)
- N**—Decree of November 24th, 1923. (Regulating Private Wireless Stations.)

A The following is the Decree dated March 5th, 1907 (modified and completed by the following decrees): April 26th, 1910; February 5th, 1911; May 27th, 1911; November 20th, 1911; July 31st, 1919, which superseded the decrees of February, 1903, and February 27th, 1904:—

ART. 1.—All wireless telegraph stations in France, in Algeria and in the Colonies are in times of peace worked by the Administration of Posts and Telegraphs with the exception of:—

(a) Coast stations communicating with warships and naval establishments ashore.

(b) Stations on military territory, or engaged solely on military work.

(c) Stations which are purely military in character and which in times of peace are only occupied in periodically exchanging practice telegrams.

(d) Special stations on lighthouses and buoys.

(e) Stations erected for internal communication, either within the boundaries of any one territory, or to communicate between two neighbouring territories, two groups of neighbouring territories, and a colony, or a group of colonies, with a neighbouring foreign country always providing, of course, that for other than local communication (which would be exceptionally allowed).

Questions of contract and tariff would be regulated between the departments concerned (Ministry of the Colonies), Administration of Posts and Telegraphs and, if existing, Ministry of Foreign Affairs.

Any deviation from this rule will form the subject of discussion between the Ministries concerned.

ART. 2.—In the event of mobilisation all radiotelegraphic stations, without exception automatically fall under the authority of the Ministries of War and of the Navy.

In case of mobilisation the Ministries of Marine and War shall automatically assume control of all stations, without exception.

3. The choice of sites for the proposed range of a station and all technical conditions

applicable to each projected station shall be submitted for the consideration of an Inter-ministerial Commission formed in accordance with Article 4 of this Decree. The function of this Commission is to study the various aspects of the service to be carried on and to indicate to the Administrative Departments affected the conditions that are necessary to reconcile their respective interests.

4. The Inter-ministerial Commission shall be appointed by the Minister of Public Works, Posts and Telegraphs, and shall comprise the following members:—

One President and one Vice-President appointed by Presidential decree from the Departments interested.

Three representatives from the Ministry of Marine.

Three representatives from the Ministry of War.

Two representatives from the Colonial Office.

One representative from the Foreign Office.

One representative from the Ministry of Commerce and Industry.

Four representatives from the Ministry of Public Works.

Three representatives from the Administration of Posts and Telegraphs.

A secretary who shall belong to the Post and Telegraph Administrations. He shall have no voting powers.

5. The Commission shall examine the title to sites and technical conditions appertaining to all stations which shall constitute the French radiotelegraphic network; examine complaints regarding French stations; consider such administrative problems concerning the radiotelegraphic service as the Ministry of Public Works, Posts and Telegraphs deems fit to submit to it; institute experiments of general interest. The Commission shall be informed through the departments represented thereon of results obtained by various types of apparatus employed at stations in operation.

6. Exclusive of the periods of mobilisation, stations established, kept up, and worked by Administrations other than that of Posts and

Telegraphs may be open to public service in agreement with the Administration.

7. The Post and Telegraph Administration shall be responsible for all matters concerning the collection and taxes, foreign stations, and the International Bureau at Berne. It shall supervise the administration of international regulations in so far as they concern commercial traffic passing through coast stations in France, Algeria and Tunis, as well as through stations on vessels of the mercantile marine.

8. Licences to establish private stations shall be granted by the Post and Telegraph administration referred to in Article 4. Such licences shall only be of a temporary character, and the stations are strictly forbidden to interfere with the working of other stations.

9. Cost of experiments carried out on the demand of the Commission are regulated by special credit, negotiated through the budget of the Administration of Posts and Telegraphs.

10. The Ministers of Public Works, of Posts and Telegraphs, of War, of Marine, of Colonies and Foreign Affairs are charged in so far as concerns their respective departments, with the carrying out of this decree.

11. The provisions of the decree of February 7th, 1903, and of the decree of February 27th, 1904, are abrogated.

12. The provisions of Articles 2, 3, 5, 6, 7, and 8 are not applicable to the Colonies as far as local stations, as defined in Paragraph (e) of the 1st Article, are concerned.

The organisation of these stations, in the event of mobilisation, is regulated by Governors General and Governors in agreement with the Departments of War, of the Navy and of Colonies.

The personnel of the Administration of Posts and Telegraphs attached in any Colony to an Inter-Colonial Wireless Telegraph Station, not falling under one of the headings specified in Paragraph 5 of the 1st Article receives its working instructions from the Metropolitan Administration of Posts and Telegraphs.

These instructions are transmitted to it through the intermediary of the Administrative Authority of the Colony, except in case of urgency, and on condition that this authority is advised of them with as little delay as possible.

This personnel is placed, in regard to general discipline, under the surveillance and the authority of the high functionary who administers the territory in which is located the station. This high functionary gives to the supervised personnel annual notes, a record of which is kept in connection with their advancement.

Modifications other than those connected with the material of the stations, questions concerning the working and general organisation of the service are regulated in agreement with the Metropolitan Administration of Posts and Telegraphs and the Colony.

Colonial Military Stations are under the supreme authority of the respective Governors.

B DECREE of February 24th, 1917, relating to the reception and transmission of radiotelegraphic signals.

ART. 1.—Private individuals and corporations are forbidden to establish or make use of telegraphic machinery, or apparatus, or any fittings whatsoever capable of transmitting or receiving signals, without the express authorisation of the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs either on French territory or above that territory, or on board French vessels.

The employment on board foreign vessels in French territorial waters of wireless apparatus or installations, is forbidden, except in conformity with the rules laid down by the French Government for the employment of such apparatus and installations in the aforesaid territorial waters.

ART. 2.—Authorisation for the establishment of a transmitting radiotelegraphic station is only granted to private individuals, or corporations, under the proviso that no let or hindrance shall be able to arise therefrom to the detriment of the working of public stations. The minister, whenever he shall think fit to authorise (after consultation with the Ministers of War and Marine) the establishment of any proposed station, shall lay down the conditions under which that station shall be erected and worked.

ART. 3.—Receiving wireless stations require the same authorisation, under the same conditions as transmitting stations.

It is understood, however, that stations destined for the reception of time and weather signals, whose erection is sought by French citizens, may receive due authorisation by the head of the local Postal and Telegraphic Service (when the latter is asked to do so by the parties interested) under the conditions laid down by a Decree of the Minister for Commerce, Industry, Agriculture, Labour, Posts and Telegraphs (after consultation with the Ministers of War and Marine). Special measures may be carried out under the authority of the Ministers of War and Marine in view of the concession in favour of stations of the kind above mentioned in certain stated districts.

ART. 4.—The royalties due from those who have been granted leave to erect stations are fixed by the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs and worked in consultation with the Minister of Finance.

Stations for the reception of time and weather signals shall be only liable to payment of a fixed royalty of five francs per year per station.

ART. 5.—In times of war—

(a) All private wireless stations, with the exception of those used by, or on behalf of military authorities must be dismantled. The owners of such stations must remove the antennæ, and deposit the essential parts of their sending and receiving apparatus in places designated for that purpose by the Postal and Telegraphic authorities.

(b) The antennæ of wireless stations of mercantile vessels must be dismantled during the whole of the stay of such vessels in French ports and/or territorial waters, unless they have received special authorisation not to do so from the Naval Authority. Moreover, the Marconi Cabin must be locked up and the key placed in the hands of the master of the vessel. No work (either in the way of overhaul, repair, etc.) may be executed unless the aforementioned officer has assured himself that the work is being carried out by persons authorised to do so.

(c) It is within the option of the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs (acting after consultation with the Minister of War and Marine), to prohibit for the time being all manufacture, vending or sale of radiotelegraphic apparatus, except under special licence.

ART. 6.—The rules laid down under Chapter V of the Decree-Law, dated December 27th,

1851, are applicable to the conditions laid down by the present Decree.

In times of war any representative of the Minister of War, or the Minister of Marine shall be qualified equally with the Minister himself to institute the proceedings provided for in Art. 10 of the aforesaid Decree-Law.

Moreover, in times of war the War Office and Admiralty shall also have power to take the provisional measures laid down in Art. 12 of the Decree-Law of December 27th, 1851, if in their opinion such measures are matters of urgency.

Statements drawn up by officers of the French Forces, either on land or sea shall not require to be taken on oath. They are to be viewed as absolutely reliable unless the contrary shall have been proven.

C DECREE of December 15th, 1917 (as modified by Decrees of May 15th, 1919, and March 21st, 1920).

ART. 1.—The Ministers of Commerce, of Industry, of Posts and Telegraphs have appointed an extra Parliamentary Committee charged :—

(1) With the centralisation and examination of all general questions concerning the establishment of radiotelegraphic services and the exploitation of Inland, Inter-Colonial and International Wireless Telegraphy with the exception of the following :—

(a) The Military and Naval Organisation of the Inter-Allied Services established purely for Military or Naval purposes.

(b) Colonial services organised to ensure internal communications in any particular colony, or between two neighbouring colonies, two neighbouring groups of colonies, and a colony, or a group of colonies with neighbouring foreign countries.

(2) As a result of this examination to prepare on broad lines legislative, or administrative regulations to be brought into force as soon as possible after the cessation of hostilities, the National Organisation of the Radiotelegraph Service which forms a part of the General Telegraph Service without infringing Art. 2 of the Decree of March 5th, 1907.

ART. 2.—This Commission will be composed as follows :—

Four members of the Senate.

Eight members of the Chamber of Deputies.

Seven representatives of the Ministry of Public Works, *i.e.* :

(a) Four representatives of the Administration of Posts, Telegraphs and Telephones.

(b) One representative of the Services of Harbours of the Mercantile Marine and of Fisheries.

(c) One representative of the Service of Lighthouses and Buoys.

(d) One representative for the Service of Civil Aeronautics and Aerial Transport.

Three representatives of the Ministry of War.

Three representatives of the Ministry of Marine.

Three representatives of the Ministry of Colonies.

One representative of the President of the Council.

One representative of the Ministry of Foreign Affairs.

One representative of the Ministry of the Interior (service of public safety).

One representative of the Ministry of Public Instruction.

One representative of the Ministry of Finance.

Two representatives of the Radioelectrical Industry.

One representative of the Staff of the Wireless Service of the Mercantile Marine.

ART. 3.—The Commission formed under the present Decree will be presided over by the Under-Secretary of State for Posts and Telegraphs, assisted by two Vice-Presidents chosen from amongst the Members of Parliament.

ART. 4.—The members of the Commission will be nominated by a Decree based on the report of the Minister of Posts and Telegraphs, of the Minister of War, of the Minister of Marine, and of the Colonial Minister, after the Head of each of the other Administrations mentioned in Art. 2 above shall have named their representatives to the Minister of Posts and Telegraphs.

ART. 5.—The active Members of the Commission who are bound to be present at a meeting may absent themselves on condition that their place is taken by a member of their same service who will represent them with votive powers.

ART. 6.—All previous regulations on this subject are hereby abrogated.

ART. 7.—The President of the Council, the Minister of War, and the other Ministers interested are charged, in so far as concerns their respective departments, with the carrying out of this Decree, which will be published in the *Journal Officiel* and inserted in the *Bulletin des Lois*.

FORM OF SHIP'S LICENCE.

D

FRENCH REPUBLIC

MINISTRY OF COMMERCE AND INDUSTRY, POSTS AND TELEGRAPHS.

Office of Control, Telegraphic Administration.

Licence delivered in accordance with Article IX of the International Radiotelegraphic Convention Service Regulations.

In consideration of the undertaking given by the applicant and the particulars furnished by.....

And in consideration of the arrangements under the Convention and the Radiotelegraphic Regulations as codified in London on July 5th, 1913; and especially of Articles III, VII, VIII, X, XI, XIII, and XVI of the aforesaid Regulations.

And in consideration of the report supplied by the Engineer-in-Charge of the Radiotelegraphic Service following on his visit to the station on board.....

Authorisation is hereto given for the installation and maintenance of the radiotelegraphic station on board thewhich is scheduled under class.....

The present licence is available for as long as the Radiotelegraphic Convention and Regulations of London remain in force.

Given in Paris on the.....day of

(Signed) on behalf of the Minister of Commerce, Industry, Posts and Telegraphs by

Chief of the Telegraphic Administration.

UNDERTAKING

GIVEN BY

Who in consideration of an authorisation to install and maintain a wireless telegraph station on board the s.s. declares himself willing to submit, without reserve, to the clauses and conditions of the agreement whereof the text is herewith subjoined, with the object of obtaining such

authorisation for utilising a wireless station on board the s.s.

ART. 1.—The installation of the proposed wireless station shall be submitted to the preliminary approval of the Administration of Posts and Telegraphs. Only apparatus manufactured in France, from materials supplied by builders or manufacturers having their workshops in France, can be employed in the construction of this radiotelegraphic station.

The average range of the station shall be

In the event of its being recognised—in consequence of improvements carried out in radiotelegraphy (affecting range, syntax, wave direction, etc.)—that important modifications can be adopted in the ship's station, the Administration of Posts and Telegraphs reserves to itself the right of providing for the adoption of such improvements.

Every subsequent alteration made to the station must be notified to the Administration of Posts and Telegraphs and receive official approval before its inception.

ART. 2—..... shall take every care necessary to ensure that the installation, maintenance, and usage of the station, as well as any modifications introduced in accordance with the preceding article, shall be carried out without involving any expense to the Administration of Posts and Telegraphs.

ART. 3—All contracts, agreements, etc., which have been entered into, or which shall in the future be entered into, between and the manufacturers of wireless apparatus, or which have been or shall be made with wireless companies, for the construction and maintenance of the station, shall—before being put into effect—be submitted for the approval of the Administration of Posts and Telegraphs.

ART. 4—A charge in favour of the ship's station may be levied on the aforementioned vessel; its amount being fixed by the Administration of Posts and Telegraphs in agreement with This charge shall not be made on official communications of the French Republic.

..... shall be liable to be called upon to place in an office of the Posts and Telegraphs a deposit, by way of guarantee for the charges received on board, and for which he is accountable to the Administration of Posts and Telegraphs.

In the event of the administration of the authorised station being granted to a company, shall remain responsible for the charges received on board.

ART. 5.—All telegraphists entrusted with the manipulation of apparatus must be of French nationality, and subject to the approval of the Administration of Posts and Telegraphs.

ART. 6.—The contents of telegrams transmitted by wireless, which reach the ship's station without being intended for shall not be divulged to anyone whatsoever outside the officials appointed by the Administration of Posts and Telegraphs, or the competent officers of judicial police. No use whatsoever may be made thereof.

ART. 7.—The Administration of Posts and Telegraphs may, if it seems good to them, demand at any moment, and on immediate requisition, that the station on board shall be temporarily or permanently, taken over by State officials. These officials shall be accommodated on board in the class corresponding to their grade. Their messing may be charged for, but not their transport. In such cases the

Administration of Posts and Telegraphs shall render account to..... for the board ship charges due to him after making deduction of cost of upkeep of the station.

In the event of the Administration of Posts and Telegraphs deciding to apply the foregoing provision they may employ wireless telegraphic apparatus of a different type to that utilised by They reserve, moreover, the right, in case of need, of placing such apparatus on board in advance.

ART. 8.—The Administration of Posts and Telegraphs shall exercise in the manner which seems best to them their right of control over the authorised ship's station (installation, transmission, and reception of radiograms, rendering of accounts, etc.).

ART. 9.—The date of the initiation of the service of the ship's station shall be fixed by agreement with the Administration of Posts and Telegraphs.

After the establishment of the installation the apparatus cannot be removed without the express consent in writing of the Administration of Posts and Telegraphs. The apparatus must be continuously maintained ready for use, and must give fifteen days' notice in advance to the Administration of Posts and Telegraphs in the event of his desiring for any reason to cease to use the station.

In the event of the ship's sale must advise the Administration of Posts and Telegraphs, informing them at the same time of the name and address of the new owner, as well of the arrangements which may have been made (should there be any such) for the closing of the station.

In any event, the aforesaid station cannot be closed down without the express consent in writing of the Administration of Posts and Telegraphs, and the holder of this licence shall remain responsible for the charges due until authorisation for transfer has been received.

ART. 10.—The licence granted to applies only to the vessel mentioned above. A new licence would be necessary, should decide to install a radiotelegraphic station on any other of his ships.

This licence can, moreover, be suspended or revoked at any time, and for any reason, without any liability on the part of the Administration of Posts and Telegraphs to pay any indemnity whatsoever, and without any obligation to state the reasons for their decision.

In particular, the licence may be revoked in the event of failure by to observe the provisions of the present agreement.

ART. 11.—..... declares that he subscribes to all the legislative arrangements and rules established, or that shall in the future be established, in France with regard to internal and international wireless service.

The wireless station which forms the subject of this licence shall exchange radiotelegrams with all the coast or ship stations within the sphere of action of which it shall come without any distinction of the radiotelegraphic system adopted by these stations.

ART. 22.—The State shall not be subject to any responsibility through difficulties which may arise between and private individuals, companies or corporations, to whom authorisation for carrying on wireless telegraph stations may have been granted; or in general with anyone soever or for any reason.

ART. 13.—The stamp duties appertaining to the present licence are payable by

Given on the day of

LAW OF JULY 31ST, 1919.

E The President of the Council; the Minister of War; the Minister of Marine; the Minister of Public Works, Transports and of the Mercantile Marine; the Minister of Commerce, of Industries, of Posts and Telegraphs; the Minister of Colonies, having seen the Decree of March 5th, 1907, Hereby decree:—

ART. 1.—Radiotelegraph Stations joining departments other than the departments of War and of Marine are in times of peace, in view of their utilisation in war time, under the control of a special commission instituted by the Minister of War (General Staff of the Army).

ART. 2.—The Commission is presided over by one of the sub-heads of the General Staff of the Army and comprises a representative of each of the following Ministries: Marine, War, Public Works, and Colonies, as well as of the Administration of Posts and Telegraphs.

These representatives, who are nominally elected by the Administrations which they serve, are in principle the Directors of the Wireless Service in their respective Administrations.

Each has an assistant, also nominally elected, and with authority to take the place of the former in case of absence.

An officer of the General Staff of the Army carries out the functions of Secretary, with voting powers.

ART. 3.—The Commission will give its advice on all questions relative to the best means of utilising Radiotelegraph Stations, both fixed and portable in time of war.

It will especially occupy itself with the control of mobilisation of Non-Military Wireless Telegraph Stations, and to investigate experiments of every kind made to improve the utility of wireless in time of war of Non-Military Stations as suggested by the different Ministerial Departments.

ART. 4.—At least once a year, and more often if necessary, the Commission will inspect Non-Military Stations and their technical equipment, and will also test the professional knowledge of the personnel. Each inspection will be made by a representative of the Administration working the station and by a representative of the Ministry of War or of the Ministry of Marine according as to whether the station falls under the authority of the one or the other.

The Commission chooses those of its members who will undertake the inspection, or will ask the departments interested to make the necessary selection from their personnel.

A *procès-verbal* will be prepared after each inspection and forwarded to the Commission.

ART. 5.—The Commission will transmit its reports and the *procès-verbaux* of its sittings to the Ministers concerned through their representatives. The Ministers will take what steps are necessary in view of these communications.

ART. 7.—In the Colonies the inspection on Non-Military Stations and of their technical equipment as also that of the professional knowledge of the personnel is carried out according to rules formulated under Articles 3 and 4, by representatives of the departments concerned who are chosen by the Governors-General or Governors.

Reports are transmitted by these High Functionaries to the Department of the Colonies. The latter formulates, if necessary, its observations or propositions.

LAW OF AUGUST 9TH, 1920.

CHAPTER I.

F STATIONS FOR THE SERVICE OF AERIAL NAVIGATION.

ART. 1.—The Service of Aerial Navigation installs and exploits all Radioelectric Stations

which are necessary to assure the carrying out of the Service and the security of aviators.

ART. 2.—The technical particulars of these stations (location, power, nature of transmission, wavelength, call letters) are arranged between the Under-Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport.

ART. 3.—If interference is caused by Stations of the Service of Aerial Navigation, or if these are interfered with by foreign stations the Under-Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport will agree on the technical means to be employed to avoid such interference.

ART. 4.—Certain stations of the Service of Aerial Navigation may be open to private correspondence by arrangement between the Under-Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport. In this case the tax payable for each telegram will be established in accordance with the rules in force for radiotelegraphic correspondence with ships at sea.

CHAPTER II.

LAND STATIONS INSTALLED BY PRIVATE COMPANIES.

ART. 5.—Land Radioelectric Stations may be installed by Companies for Aerial Navigation, or by private persons with the object of communicating with aviators or to ensure their safety.

These stations and their personnel will be subject to the rules already issued, or to be issued in the future by the Administration of Posts and Telegraphs, for all private Radiotelegraph Stations.

ART. 6.—Requests for permission to install stations and for licences for personnel must be sent to the Service of Aerial Navigation. If the latter decides that they are justified by the necessities of aerial traffic, and that they will not compete with its own installations, such requests are forwarded to the Administration of Posts and Telegraphs together with their remarks. If the Administration grants such authorisation this will be made through the Service of Aerial Navigation, who, in turn, will advise the applicant.

ART. 7.—The Under-Secretary of State for Posts and Telegraphs delegates to the Under-Secretary of State for Aviation and Aerial Transport the control and working of stations defined in Article 5. It retains, however, its direct right of control in so far as complaints concerning the stations or the services committed by the latter are concerned. In this case a warning is given to the Under-Secretary of State for Aviation and Aerial Transport in order that a representative of this department may attend the enquiry and give his views. He makes a direct report to his department.

CHAPTER III.

AIRCRAFT STATIONS.

ART. 8.—Aircraft Radioelectric Stations are of two categories, those of the first category being utilised both for safety in navigation and for private communication; those of the second category being utilised solely for safety in navigation.

ART. 9.—The installation of all the stations defined in Article 8 and their control are under the same rules which regulate Wireless Stations of the Mercantile Marine.

ART. 10.—The personnel of stations of the first category are subject to the same rules as the Radiotelegraphic personnel of the Mercantile Marine.

ART. 11.—The personnel of stations of the second category must be in possession of a Special Licence granted by the Under-Secretary of State for Posts and Telegraphs.

ART. 12.—The Under-Secretary of State for Posts and Telegraphs delegates to the Under-Secretary of State for Aviation and Aerial Transport the right to authorise the installation of stations as defined in Article 8, also their control and working with the following exceptions :—

(a) Only apparatus of the type agreed upon by the Under-Secretary of State for Posts and Telegraphs may be authorised, and

(b) The Under-Secretary of State for Posts and Telegraphs exercises his direct right of control when he receives complaints concerning these stations, or of mistakes committed by them. In this case he warns the Under-Secretary of State for Aviation and Aerial Transport in order that a representative of the latter department may take part in the enquiry and give his views. He makes direct report to his department.

ART. 13.—In order to permit of the control during a flight of Radioelectric Installations, the authority in charge of all aircraft must freely allow representatives of the Administration of Posts and Telegraphs and of the Service of Aerial Navigation to make inspection on board from time to time.

ART. 14.—Requests for authority to install stations on board aircraft must be sent to the Service of Aerial Navigation. It should be stated whether stations of the first or second category are required.

CHAPTER IV.

ART. 15.—The stations mentioned in Articles 5 and 8 are subject to "Subscription" tax for management expenses which the Controlling Company is obliged to pay over to the Treasury. This Subscription Tax is fixed at 200 francs annually per kilowatt and per station, any fraction of a kilowatt being counted as one kilowatt and the minimum amount payable per station being fixed at 200 francs. It is payable to the State on January 1st for a complete year, and is due from the day when the station is put in commission; for the first year the amount is calculated proportionately to the time yet to run before December 31st.

ART. 16.—Any company which benefits under the arrangements of this regulation for a given time will only be taxed for a portion of the aircraft affected. The Under-Secretary of State for Aviation and Aerial Transport will determine the number of the latter; failing the total of aircraft affected the number of them which should come within the scope of this regulation.

ART. 17.—Every time that an aircraft is replaced by another the licence granted for the wireless station will be valid for the second machine and a fresh tax will not be payable.

ART. 18.—In all localities where no Radioelectric Station controlled by the Administration of Posts and Telegraphs exists for communication with aviators, the Service of Aerial Navigation and the Controllers of Stations named in Article 5 must receive and transmit gratuitously all Official Government Telegrams, on condition that they ename from or are destined for aircraft.

ART. 19.—In case of interruption of their radio communication the Service of Aerial Navigation and the Controllers of the Station named in Article 5 are authorised to route their urgent service radio communications through the Administration of Posts and Telegraphs, which will give them priority in transmission.

Reciprocally the Service of Aerial Navigation and the Controllers of Stations named in Article 5 must, in the case of interruption of radio communications of the Administration of Posts and Telegraphs, transmit gratuitously through their stations during the hours at which they are open, official or private telegrams destined for aircraft which may be sent to them by the Telegraphic Offices of this Administration.

ART. 20.—Radio communications relative to the flight and safety of aircraft have priority over those set out in Articles 4, 18, and 19.

ART. 21.—The present law will be deposited with the Under-Secretary of State for Posts and Telegraphs (Central Service) and with the Under-Secretary of State for Aviation and Aerial Transport for notification to those whom it concerns.

DECREE OF AUGUST 26TH, 1920, FIXING THE TAX FOR RADIOGONIOMETRIC MESSAGES.

G ART. 1.—Each Radiogoniometric Message sent by a Land Station at the request of a Mobile Station (Aircraft) will be liable to a fixed Coast Tax of 6 francs.

ART. 2.—Mobile Wireless Stations belonging to the Departments of the Navy and of War (warships and war aircraft) are exempted from the Radiogoniometric tax.

ART. 3.—In accordance with Article 6 of the Law of November 29th, 1850, the State accepts no responsibility in connection with Radiogoniometric Messages.

ART. 4.—The date of the announcement of the application of the tax mentioned in Article 1 will be fixed by a Law of the Under-Secretary of State for Posts and Telegraphs.

ART. 5.—The Minister of Public Works and the Minister of Finance are charged, in so far as they are respectively concerned, with the carrying out of the present Decree, which will be published in the *Journal Officiel* and inserted in the *Bulletin des Lois*.

DECREE OF MAY 14TH, 1921, MODIFYING ARTICLES 3 AND 4 OF THE DECREE OF FEBRUARY 24TH, 1917, RELATING TO RECEIVING STATIONS.

H ART. 1.—The dispositions of Articles 3 and 4 of the Decree of February 24th, 1917, relative to the reception of radioelectric signals are modified as follows :—

ART. 3.—Radioelectric receiving stations of all kinds are authorised under the conditions fixed by a special law for each category made by the Under-Secretary of State of Posts and Telegraphs after notice due to the ministerial departments interested.

ART. 4.—The royalties payable to the concessionaries of the authorised stations are fixed by the Under-Secretary of State of the Posts and Telegraphs by agreement with the Minister of Finance.

Stations for the reception of time and meteorological signals and experimental stations are subject to a payment fixed at 10 francs per station per year.

ART. 2.—The Ministries of Public Works, of War, the Navy and Finance are charged etc.

DECREE of June 2nd, 1920, relating to the establishment of private radioelectric communications.

The Under-Secretary of State for Posts and Telegraphs.

Considering the decree law of December 27th, 1851, concerning the monopoly and the surveillance of the telegraph lines.

Considering the law of April 5th, 1878, relating to the subscriptions agreed to at reduced prices with regard to telegraphic correspondence.

Considering the decree of May 13th, 1879, relating to the concessions of private telegraph lines.

Considering the decree of February 24th, 1917, relating to the reception of radioelectric messages.

Considering the law of March 29th, 1920, relating to the increase in postal, telegraph and telephone charges.

Proposed by the Director of Telegraphic Exploitation.

ORDERS.—The conditions of establishment and use of the radioelectric stations, which, by application of the decree of February 24th, 1917, can be conceded to private individuals, after judgment of the Ministers of War and of Marine relating to the laying of lines of communications serving for the exchange of correspondence of private interest, run as follows—

ART. 1.—The petitioner must inform the Administration of Posts and Telegraphs of the names of the apparatus which he proposes to use, in mentioning their characteristics and origin, as well as an idea of the communication he proposes to carry on.

He must furnish to the Administration in the course of the working of the conceded stations all information which may be demanded of him.

The stations are installed, exploited and maintained by him and at his expense.

All further modifications to these installations must be notified, first of all, to the Administration of Posts and Telegraphs.

The power of the waves issued must be strictly limited to such as to secure good communication. Only such lengths of waves may be used as is arranged by the Administration of Posts and Telegraphs after an understanding with the concessionaires.

ART. 2.—The fees fixed for right of using the private lines and stations, as well as the dispositions relative to this right of use, are applicable to the private radioelectric communications. This right of use is calculated on the basis of the number of stations belonging to one concession and the distance in kilometres, measured as the crow flies, separating two corresponding stations. When one of the stations is working, the distance considered is the average distance to which the communications reach.

The charge for the right of use is payable from the day on which communication starts working. It is calculated for the first year in proportion to the time to run till December 31st; for the following years it is acquired by the State from January 1st for the whole year, and must be paid at the first application of the Administration.

ART. 3.—The conceded radioelectric stations can only be used for the exchange of correspondence to be effected between them.

ART. 4.—The concessionaire must not divulge to any person whomsoever outside the officials appointed by the Administration or competent police officers, the contents of the telegrams or conversations collected by his stations and which may be transmitted by other radioelectric stations.

He must make no use whatever of them.

The concessionaire is responsible for any divulgations which may be made by his agents employed in the service of the conceded stations.

ART. 5.—The transmissions effected by the concessionaire must not disturb those effected by the State for its own uses.

The concessionaire must, at every request of the Administration, cease the transmission effected by his own stations during such time as is demanded.

He has to transmit, whenever required, the official correspondence, giving it priority over all other telegrams, and to assure of its despatch to the addressee, without any indemnity whatever.

ART. 6.—The Administration of Posts and Telegraphs reserves to itself the right to exercise control over the stations of the concessionaire, either permanent or temporary, as it may see fit, and in the manner in which it may seem to it most suitable. Expenses of every kind which the control should incur are repayable by the concessionaire on production of the vouchers prepared by the administration of Posts and Telegraphs 48 hours beforehand, his intention to start working his stations. The Administration may, if it recognises the necessity, demand at any moment and at the first application that the stations should be disestablished either temporarily or permanently by its agents.

ART. 7.—The State undertakes no responsibility whatever in consequence of any difficulties which may arise between the concessionaire and private individuals, companies or societies to which authorisation may have been accorded to exploit radioelectric stations or, generally speaking, with whomsoever and for whatever reason it may be.

ART. 8.—The concessions accorded are essentially precarious and revocable. In consequence the Administration of Posts and Telegraphs can, at any time and for any reason whatever, suspend or revoke the authorisations accorded without being called upon to pay any indemnity for whatever cause, nor need it give any notice for its decision.

At the first application of the Administration of Posts and Telegraphs, the concessionaire must place his stations out of working order, either for reception or transmission.

A period of one month may be allowed for the suppression of authorised stations. If this period has lapsed, the Administration of Posts and Telegraphs may proceed on its own account to the operation of such suppression costs to be paid by the concessionaire.

No radioelectric station which has been conceded may be transferred without the express written consent of the Administration of Posts and Telegraphs.

ART. 9.—The accorded concessions are in the fullest sense subject to all legal enactments, whether executive or administrative, made, or which may be made, on the subject of the exchange of messages by electric waves, of the establishment of radioelectric stations or concessions of private lines and stations, as well as any fees which may be exacted at any time.

ART. 10.—The present order will be lodged at the office of the Under Secretary of State for Posts and Telegraphs (Central Service) to be noted by whom it may concern.

Paris, June 2nd, 1920.

The Under Secretary of State for Posts and Telegraphs.

(Signed)

DESCHAMPS.

DECREE OF JUNE 18TH, 1921.

J Fixing the conditions of the establishment and use of transmitting radioelectric stations, which, by the application of the Decree of February 24th, 1917, may be granted for experimental purposes after notice to the Minister of War and the Navy.

ART. 1.—Applications for licences to be addressed to the Administrator of Posts and Telegraphs.

The applicants must state the precise situation of the station, together with its principal technical characteristics (system of transmission, power, wavelength, etc.), and furnish a diagram of connections of the apparatus as it will be used.

These particulars must be accompanied by full details of the purpose of erection and use, when the applicant proposes to use a power greater than 100 watts and a wavelength of more than 200 metres.

All important modifications of principle which may be made later in the constitution of a licensed station must be notified to the Administrator of Post and Telegraphs who will examine it and make such alterations to the original licence as will render it applicable to such modification.

ART. 2.—If there is no objection to the establishment of the projected station the applicant is invited to give under stamp in duplicate an engagement to place himself under the conditions set out by the present law.

ART. 3.—When he is notified that he has been accorded the licence, the licensee can proceed to erect his station at his own trouble and expense, the cost of maintenance falling also to him.

ART. 4.—Licences given do not constitute a privilege or prevent further licences of the same nature being given later to any applicant whatever. They are not transferable.

The licences are essentially revocable.

The Administrator of Posts and Telegraphs can at any time and for any reason suspend or revoke licences given without payment of any indemnity and without giving any reason for this decision to the licensee.

At the first request by the Administrator of Posts and Telegraphs the licensee must immediately put his station out of action. A maximum delay of one month can be given for the definite suppression of the station.

In the case where the licensee does not obey the request of the Administrator of Posts and Telegraphs they can proceed at the cost of the licensee to put out of action and suppress the said station.

The licensee can at any time by his own wish terminate his licence. In this case also are applicable the preceding dispositions concerning the putting out of action and dismantling of the station.

The licences for experimental transmitting stations being given at the holder's risk, the State has no responsibility for difficulties which may arise between the licensee and societies or companies to whom licences have also been given or in general for any cause or reason whatever.

ART. 5.—The station licensed can only be used for scientific researches or the testing of apparatus, they may not serve in any case to transmit correspondence having a character personal or actual even in the particular or personal interest of the licensee.

ART. 6.—The use by a licensee of a transmitting station with a receiving station attached entails for the licensee the obligation to submit

himself to the dispositions and regulations relative to the establishment and use of radioelectric receiving stations and to apply to the Administrator of Posts and Telegraphs for the corresponding licence.

ART. 7.—The Administrator of Posts and Telegraphs reserves to itself the right to exercise a control permanent or temporary on licensed stations in any manner which appear to them to be the most convenient.

Moreover, the licensee when he is notified that he has been accorded a licence must make the payment given in Article 4 of the Finance Law of July 31st, 1920.

ART. 8.—Licences granted are subject to all laws, regulations, and legislation which may intervene.

K ORDER OF 30th DECEMBER, 1922, RELATING TO RADIOELECTRIC RECEIVING STATIONS.

The Under-Secretary of State for Posts and Telegraphs, considering the Decree of 24th February, 1917, concerning the transmission and reception of radioelectric signals;

Considering the Decree of 15th May, 1921, modifying the above;

Considering the Orders of 27th February, 1920, and 6th July, 1921, concerning private receiving stations.

Considering the advice of the Ministers of War, of the Navy and of the Interior;

On the proposal of the Director of Telegraphic Exploitation.

ORDERS :—

ART. 1.—The establishment of private wireless stations employed solely for reception is authorised subject to the condition that the petitioner shall furnish in duplicate, one copy being on stamped paper, a declaration in conformity with the Schedule annexed to this order.

This declaration to be addressed to the Director of Posts and Telegraphs of the department in which the station will be installed and should be accompanied by documents proving the identity, address, and nationality of the applicant. A receipt for it is given to the applicant. In the event of the applicant being unable to prove his French nationality, the establishment of the wireless receiving stations remains subject to a special authorisation from the Under Secretary of Posts and Telegraphs, after agreement with the Departments of the Interior, Foreign Affairs, War and Navy.

ART. 2.—Receiving Stations must not cause annoyance of any kind to neighbouring stations, even in the case of receiving apparatus giving out waves of weak intensity from the aerial. Every precaution must also be taken to reduce to a minimum this emission of waves by the receiver.

ART. 3.—Private wireless receiving stations are to be established, worked and maintained under the charge and at the cost of the licensee. The State does not assume any responsibility on account of these actions.

ART. 4.—The licensee of a private wireless receiving station must observe secrecy regarding all correspondence not addressed to him and which he has intercepted. Such correspondence must not be disclosed except to officials appointed by the Administration of Posts and Telegraphs or to authorised police officials.

ART. 5.—The Administration of Posts and Telegraphs reserves the right to exercise such control as it deems fit over private wireless receiving stations.

ART. 6.—Private wireless receiving stations are subject to an annual Statistics Tax (*droit annuel de statistique*) indivisible and due from the 1st January to the 31st December in each year. This tax is 10 francs. It is chargeable on each independent receiver.

ART. 7.—The authorisations granted carry no privileges, nor can they constitute any obstacle to similar authorisations which may subsequently be granted to any other applicant. They are not transferable to a third party. They are revocable by the Under-Secretary of State for Posts and Telegraphs without payment of any indemnity and without any obligation to disclose the reason for the decision. At the first application from the Administration of Posts and Telegraphs, the licensee must at once put his station out of working order. In the event of his not obeying this injunction, the Administration may proceed to put it out of working order at the expense of the licensee.

ART. 8.—The provisions of the Orders of 27th February, 1920, and 6th July, 1921, are revoked.

ART. 9.—The present Order will be deposited with the Under-Secretary of State for Posts and Telegraphs (Central Service) for notification to those whom it may concern.

Paris, the 30th December, 1922.

(Signed) PAUL LAFFONT.

FORM OF DECLARATION FOR PRIVATE RADIOELECTRIC STATIONS.

I, the undersigned.....(name, Christian names, profession, address).....of.....nationality, declare that I am the owner of.....private wireless receiving stations for the use of which I undertake to submit, without any reservation, to all the regulations prescribed or to be prescribed regarding the establishment and use of private radioelectric stations.

Destination of the station and purpose for which it is used by the applicant.

Exact position of station.

General description of station (principal technical characteristics, type of apparatus used, number of independent receivers).

At..... the.....19

To the Director of Posts and Telegraphs at.....

Noted, without remarks.

At..... the.....19

Director of Posts and Telegraphs.

DECREE DATED APRIL 6TH, 1923, RELATING TO WIRELESS TELEGRAPHY ON SHIPS.

L *Extract from the Journal Officiel of the 8th April, 1923.*

The President of the French Republic.

On the report of the Minister of Public Works.

In view of the Law of April 17th, 1907, concerning the security of maritime shipping and the working regulations on board commercial ships, and especially of Article 53, paragraphs 4 and 5, of the said Law reading as undernoted :—

ART. 53.—A public regulation of administration issued on the suggestion of the Minister of the Navy and the Minister of Commerce and Industry, after advice from the superior council of maritime shipping, shall fix :

4th. The list of nautical instruments and all articles of outfit and spare parts which must be obligatory on all vessels, as well as the conditions which these various instruments or articles must satisfy in order to fulfil their purpose ;

5th. The list of installations, small boats, salvage apparatus or machines which the vessel must possess for the purpose of ensuring

collective or individual safety, as well as the ship's communications with the shore in case of accident.

In view of the Decree of September 21st, prescribing regulations of public administration for the application of the said Law of April 17th, 1907 ;

In view of the Decree of May 5th, 1919, prescribing the allocation to the Ministry of Public Works and Transport of all the services dependent on the Commissariat of maritime transport and also the mercantile marine ;—

In view of the Decree of June 5th, 1914, prescribing the institution of the superior council of the mercantile marine ;

In view of the Decree of February 25th, 1919, relative to the organisation of the superior council of the mercantile marine ;

In view of the Decree of July 19th, 1919, instituting a permanent section of the superior council of the mercantile marine ;

In view of the advice of the permanent section of the superior council of the mercantile marine under date of June 16th, 1922 ;

The Council of State having heard this, Decrees :—

ART. 1.—Independently of the provisions prescribed by the regulations of public administration as above described of September 21st, 1908, in the interests of the security of maritime shipping, the following dispositions are applicable as regards the installation and use of wireless telegraphy on board commercial or fishing boats.

ART. 2.—With a view to the security of maritime shipping, there must be installed :—

1. A station capable of transmitting and receiving radiotelegraphic signals on commercial and shipping vessels of a gross weight of 2,000 tons and over, or taking 50 or more persons on board (including the crew), or having more than 12 passengers on board.

2. A station capable of receiving radiotelegraphic signals on commercial and fishing vessels of a gross weight of 500 tons and less than 2,000 tons, taking less than 50 persons (including the crew), or having a maximum of 12 passengers on board.

3. Vessels provided for in the foregoing Article which may be allocated to special services or for short voyages, may be excepted from this obligation by the Minister in charge of the mercantile marine service and after advice from the superior commission instituted by Articles 18 and 19 of the Law of April 17th, 1907.

ART. 4.—Ships on which radiotelegraph stations, both transmitting and receiving, are compulsory in virtue of Article 2, are divided into three classes from the point of view of watch service.

In the 1st class are included : (a) ships fitted to carry 25 passengers or more on board :—

1. If they have an average service speed of 15 knots or more.

2. If, having an average speed greater than 13 knots, they have on board 200 persons or more (passengers and crew), and if during the course of their voyage they traverse a distance of 500 miles between two consecutive ports of call.

In the 2nd class are included : (b) ships fitted to carry 25 passengers or more on board, if not included for other reasons in the first category.

In the 3rd class are included : (c) all other vessels on which a wireless telegraph station is obligatory, in accordance with Clause 1 of Article 2.

ART. 5.—The watch on vessels of the 1st class must be continuous.

On vessels of the 2nd class, watch must be kept at the times fixed either in Table 1 or Table 2, annexed to the present Decree, in accordance with the instructions given by the inspector of maritime shipping dependent upon the nature and length of the voyage.

On vessels of the 3rd class no fixed time for keeping watch is specified.

ART. 6.—The service of a station which is both transmitting and receiving shall be assured by the employment of a licensed operator, a holder of one of the certificates provided for in Article 10 of the regulations annexed to the International Radiotelegraph Convention of July 5th, 1912.

Besides this operator, there shall be an operator or licensed listener on vessels of the (b) class and two operators or licensed listeners on vessels of class (a).

These operators or supplementary listeners shall not be required in the event of the inspector of maritime shipping considering that, by reason of the nature and length of the voyage, the conditions under which the watch must be guaranteed according to the terms of Article 5 render their presence unnecessary.

On vessels where a receiving station only is compulsory, by virtue of Article 2, paragraph 2, the service of this station must be assured by the employment of one or more licensed listeners.

ART. 7.—Ship radiotelegraph stations must be able to transmit by day, from ship to ship, signals which are clearly readable under normal atmospheric conditions at a distance of at least 150 nautical miles without amplifier.

Stations or sets must be able to receive all wavelengths up to 2,800 metres on both the "stand by" and the "tuned" circuits.

ART. 8.—Transmitting and receiving radio telegraph stations must comprise a normal installation and an auxiliary installation.

Each installation must include a special chronometer and a watch measuring seconds.

The captain's bridge and the wireless cabin shall be directly connected by a speaking tube, telephone or any other method of communication.

The radiotelegraphist on watch must not leave the operating cabin.

ART. 10.—The auxiliary installation must be erected wholly above the water line. It must possess its own source of energy, which can be rapidly started and can work for at least six hours. It must have a minimum range of 80 nautical miles for vessels of the first class and 50 nautical miles for vessels of the two other classes.

The use of accumulators as a source of energy of the auxiliary installation is authorised.

If, irrespective of the conditions stipulated in the foregoing Articles, the normal installation likewise fulfils all the conditions mentioned in the present Article respecting the auxiliary installation, the latter is not compulsory.

ART. 11.—Any captain of a vessel who receives a call for assistance from a vessel in distress is bound to go to the assistance of the shipwrecked vessel.

Every captain of a vessel in distress has the right to choose from among the boats who have answered his call the one or more he judges the most capable of rendering assistance. He should not exercise this right until after having, as far as possible, made inquiries from the captains of these boats. The latter must immediately proceed at full speed to the assistance of the shipwrecked vessel.

The captains of vessels under the obligation of rendering assistance are freed therefrom

directly the captain or captains summoned have announced that they will comply with the appeal, or when the captain of one of the boats which has reached the place where the disaster is informs them that their assistance is no longer necessary.

If the captain of a boat finds it impossible or does not consider that, according to the special circumstances of the case, it is reasonable or necessary to go to the assistance of the vessel in distress, he immediately advises the captain of the latter to this effect. He must likewise enter in his ship's log the reasons justifying this decision.

ART. 12.—A trial of the wireless apparatus will be made before each voyage under the supervision of the inspector of maritime shipping, in order to test the working of the apparatus. A note will be entered in the ship's log and in the wireless log, of the inspection made previous to sailing.

ART. 13.—At the time of inspection before sailing the inspector of maritime shipping will satisfy himself that each vessel, taking into account the class to which it belongs by virtue of the present Decree, fulfils all the obligations incumbent on it.

A note of this inspection will be entered in the log.

The inspector of maritime shipping may prohibit the sailing of any ship which does not fulfil its obligations.

ART. 14.—A period of six months in which to comply with the provisions of Article 2 is allowed for vessels mentioned in Article 2 which may not yet have wireless apparatus installed as prescribed above.

ART. 15.—Radiotelegraphic apparatus installed on fishing vessels after the publication of this Decree must always be placed in the upper part of the vessel.

ART. 16.—The Minister of Public Works is entrusted with the carrying into effect of the present Decree which will be published in the *Journal Officiel* and inserted in the *Bulletin des Lois*.

Given at Rambouillet, April 6th, 1923.

A. MILLERAND.

By the President of the Republic:

The Minister of Public Works,
YVES LE TROQUER.

DECREE DATED NOVEMBER 10TH, 1923,

REGULATING WIRELESS TELEGRAPHY
ON SHIPS.

M

THE PRESIDENT OF THE FRENCH
REPUBLIC,

Having regard to the law of the 29th November, 1850, respecting private telegraphic correspondence;
Having regard to the decree-law of the 27th December, 1851, concerning the monopoly and polity of telegraph lines;

Having regard to the decree of the 5th March, 1907, relative to the establishment and working of wireless telegraph stations destined for the exchange of official or private correspondence;

Having regard to the decree of the 17th June, 1912, establishing the wireless telegraph service;

Having regard to the law of the 17th January, 1914, approving of the International Radiotelegraph Convention and its Annexes, drawn up by the London Conference of the 5th July, 1912;

Having regard to the decree of the 6th April, 1923, regulating radiotelegraphy on board commercial or fishing boats from the point of view of maritime safety;

On the report of the Minister of Public Works,

DECREES—

ART. 1.—No installation for radio communication intended for commercial working may be erected on board French commercial, fishing or pleasure boats without authority from the Government.

The authorities fix the characteristics and working conditions of the station. The working is carried out under the control of the Postal, Telegraph and Telephone Administration.

The installations referred to in the first paragraph of this Article may not be opened for working without the licence prescribed by the international radiotelegraph regulations.

ART. 2.—From the point of view of the service of public radiotelegraphic correspondence, radiotelegraph stations established on board vessels are divided, at the request of the shipowners, into the three following categories:—

First Category.—Ships stations having to undertake continuous service.

These stations are worked by three operators holding the certificate prescribed by the international radiotelegraph regulations. Two of these operators must hold first-class certificates.

Nevertheless, on the authority of the Administration of the Posts and Telegraphs, the ship stations classified under the first category may—when the vessel in question is allocated to special services or specific navigations of short duration—only be worked by two operators or by one operator.

In the two latter cases the operator or operators must possess a first-class certificate.

Second Category.—Ship stations having to undertake a service of limited duration.

The stations coming under the second category must have one or two operators on board possessing the certificate prescribed by the international radiotelegraph regulations, according to whether the station in question guarantees a service of eight hours or sixteen hours.

One at least of the operators must be the holder of a first-class certificate.

The hours during which the stations coming under this category are to guarantee watch service are those shown in the annex to the present decree.

Third Category.—Stations on ships not having any specific hours of watch. Stations coming under the third category must have an operator on board possessed of a first or a second-class certificate.

ART. 3.—The Postal, Telegraph and Telephone Administration is entrusted with the furnishing of working licences for ship stations.

The application for a licence must be made by the owner of the vessel in question who shall specify the category under which he desires the ship station to be classified from the point of view of his obligations as regards watch service for public correspondence.

ART. 4.—The Postal, Telegraph and Telephone Administration undertakes the supervision of the staff and the technical material of ship stations; this supervision shall likewise be exercised on board foreign vessels putting in at French ports.

ART. 5.—Consequent upon the supervision exercised, the Postal, Telegraph and Telephone Administration may, as regards the service of radiotelegraphic correspondence, take any disciplinary measures that it may deem advisable in respect of the staff and require any modifications in the installation it may consider necessary.

The disciplinary measures relative to the staff shall consist in a warning, a suspension of one to six months, or a definite withdrawal of the certificate. The sanctions relative to the non-

execution of the modifications in question shall consist in the application of the measure provided for in paragraph 2 of Article 12 of the 1912 London Radiotelegraph Regulations (prohibition to coast stations to accept communications from the vessel in fault with the exception of distress signals).

ART. 6.—The Postal, Telegraph and Telephone Administration is entrusted with the furnishing of certificates of proficiency to radiotelegraphists, as provided for in Article 10 of the International Radiotelegraph Regulations of London, 1912, and the certificate of an authorised listener as provided for in Article 6 of the decree of the 6th April, 1923.

A second-class certificate consists of two kinds (A and B), the second of which is reserved for operators of fishing boats and commercial boats of the third category as entered in the official nomenclature of radiotelegraph stations bearing the note "P" (private station).

A decree of the Under-Secretary of State of Posts and Telegraphs determines the conditions on which certificates of proficiency will be issued.

ART. 7.—Telegraphists must comply with the service regulations in force; in no case and for no reason may a ship station use a call signal other than that which has been allotted to it without the authority of the Postal, Telegraph and Telephone Administration.

Radioelectric communications are forbidden whilst vessels are lying in port or are at anchor, except in the latter case with regard to questions concerning navigation or the working of the ship, when the latter is not able to communicate with the land.

Nevertheless, transmission may be made respecting adjustments of the apparatus at ports and during anchoring after previous authority from the Chief of the State coast station, if there be one within a radius of 30 kilometres from the vessel, but without previous authority if there should not be one.

All service incidents of whatever nature they may be, must be recorded with all requisite particulars in the ship station's diary.

ART. 8.—The service of the ship station is placed under the supreme authority of the captain of the vessel, who shall be obliged to preserve the secrecy of correspondence.

ART. 9.—The Minister of Public Works is entrusted with the execution of the present decree, which shall be published in the *Journal Officiel*, and inserted in the Bulletin of Laws.

Given at Paris, 10th November, 1923.

A. MILLERAND.

For the President of the Republic:
The Minister of Public Works,
YVES LE TROCQUER.

DECREE, DATED NOVEMBER 24TH, 1923,
REGULATING THE ESTABLISHMENT
AND USE OF PRIVATE WIRELESS
STATIONS.
THE PRESIDENT OF THE FRENCH
REPUBLIC.

Having seen Art. 3 of the law of November 29th, 1850, regarding private telegraphic correspondence; Having seen the decree-law of December 27th, 1851, concerning the monopoly and the regulation of telegraph lines;

Having seen Art. 3 of the constitution law of February 25th, 1875;

Having seen the law of April 5th, 1878, authorising the Minister of Posts and Telegraphs to consent to subscriptions at reduced rates for the transmission of telegraphic messages when that transmission is effected outside of the usual

conditions fixed for the application of the telegraphic taxes;

Having seen Art. 25 of the law of finances of July 30th, 1913;

Having seen Art. 44 of the law of finances of July 31st, 1920;

Having seen Arts. 64 and 85 of the law of finances of June 30th, 1923;

Having seen the decrees of February 14th, 1917, and May 15th, 1921, relative to the transmission and reception of radio-electric signals;

Upon the report of the Prime Minister, Minister for Foreign Affairs, the Ministers of Public Works, of War, of Marine, of the Interior, and of Finances,

DECREES:

ART. 1.—No private wireless installation for telegraphy and telephony may be erected and used except under the conditions fixed by the present decree.

CHAPTER I.

PRIVATE RADIOELECTRIC RECEIVING STATIONS.

ART. 2.—Wireless stations used solely for the reception of signals or communications not having the character of private correspondence are divided into three classes:

1. Those installed by Departments, Communes, public establishments or public utility establishments for free performances (*auditions*).

2. Those which are installed by private persons for public or non-gratuitous performances.

3. Those which are not intended for public or non-gratuitous performances.

ART. 3.—The installation of private wireless stations used solely for the reception of signals or communications not having the character of private correspondence is authorised providing the applicant signs, in any post and telegraph office, a declaration in accordance with the form fixed by an order of the Under Secretary of State for Posts and Telegraphs.

This declaration must be accompanied by documents proving the identity, the domicile and the nationality of the person making the declaration. It is subject to the imposition of a statistical tax fixed at 1 fr. A receipt for the same is delivered to the person making the declaration.

In the case of the applicant's not proving that he is of French nationality, the installation of the wireless receiving station will remain subject to a special authorisation by the Under Secretary of State for Posts and Telegraphs under the conditions fixed for transmitting stations by Chapter II of the present decree.

ART. 4.—Receiving stations must not cause any interference with neighbouring stations, even in the case of receiving apparatus emitting waves of weak intensity in the aerial.

Every precaution must, moreover, be taken to reduce to a minimum this emission of waves by the receiving apparatus.

ART. 5. The Administration of Posts and Telegraphs is commissioned to exercise such control as it deems necessary over private wireless receiving stations. The agents entrusted with this control are to have access at any time to the premises where the stations destined for public or paying performances are installed.

ART. 6.—Wireless stations of the second class mentioned in Art. 2 destined for public or paying performances are subject to an annual fee, indivisible and due for the period from January 1st to December 31st of each year. This fee is fixed by decree countersigned by the minister in charge of Posts, Telegraphs and

Telephones, and by the Minister of Finances. Its maximum is 200 fr. It applies to every independent receiving station.

ART. 7.—The stations referred to in Arts. 2 to 6 of the present decree are only authorised to receive either signals or communications addressed: "to all" or experimental signals, private correspondence addressed either to private stations or to stations carrying on a public communication service being absolutely prohibited.

The installation of stations destined to receive private correspondence is subject to a special authorisation under the conditions fixed for transmitting stations by Chapter II of the present decree.

CHAPTER II.

PRIVATE RADIO-ELECTRIC TRANSMITTING STATIONS.

ART. 8.—The establishment of private wireless stations used for the transmission, or the transmission and reception, of signals and correspondence is subject to a special authorisation of the Under Secretary of State for Posts and Telegraphs upon the advice of an interministerial commission instituted by the Under Secretary of State for Posts and Telegraphs.

The Ministers of Foreign Affairs, of the Interior, of War and of Marine, may raise opposition to the establishment of any private wireless transmitting station liable to affect either the security of the State or the normal working of wireless stations appertaining to their services.

ART. 9.—Any wireless transmitting station not used by the State for an official or public communication service or by a concessionaire authorised to carry on a service of the same kind is considered to be a *private wireless transmitting station*.

Private wireless transmitting stations are divided into five classes:

1. Fixed stations intended for the establishment of private communications.

2. Mobile and land stations corresponding with these stations for the interchange of private communications and not subject to the provisions of international conventions or internal regulations.

3. Fixed stations intended for broadcasting communications of general interest.

4. Stations intended for tests of a technical nature or for scientific experiments.

5. Amateur stations.

ART. 10.—News of any kind transmitted by private wireless transmitting stations is subject to the control prescribed by Art. 3 of the law of November 29th, 1850, regarding private telegraphic correspondence.

The establishment and use of stations of the third class will be subject to special regulations prescribed by the Under Secretary of State for Posts and Telegraphs under the conditions fixed by Art. 12 hereunder.

Stations of the fourth class may only be used for the exchange of signals and communications regarding adjustment (*reglage*) on specified days and hours and by temporary right only.

Stations of the fifth class may be used only for communications relating to the working of their apparatus to the exclusion of all correspondence of a special or personal character.

Private wireless transmitting stations of all classes may, if required for the needs of public services, be temporarily operated at the expense of the State by agents appointed for this purpose.

ART. 11.—Every application for leave to establish a private wireless transmitting station must be addressed to the Under Secretary of

State for Posts and Telegraphs. It must be drawn up in duplicate, one copy being on stamped paper, in accordance with the form prescribed by order. It should indicate the purpose which the applicant has in view, the nature of the proposed communications, the exact spot where the apparatus will be installed, the hours required for the working of the station, the proposed technical characteristics of the installation (shape and dimensions of the aerial, type of the apparatus, total power measured by the input, *i.e.*, at the points of the installation where the electrical energy last appears in the form of direct or low-frequency alternating current before entering the high-frequency generators, type of wave, methods of modulation, wavelength). It must be accompanied by a diagram of the arrangement of the station, and if need be by a scheme of the communications it is proposed to establish, together with a list of corresponding stations.

Licensees must give a written undertaking to submit unreservedly to all the regulations already in force or to be made regarding the establishment and use of private wireless stations, as well as any special conditions which may be imposed on them by the Administration of Posts and Telegraphs.

Licences are issued only to holders of a radiotelegraphic or radiotelephonic operator's certificate granted after an examination, the conditions of which are fixed by the Under Secretary of State for Posts and Telegraphs, or to the owners of stations who have undertaken to ensure the adjustment and the proper working of their set by an operator holding one of the aforementioned certificates.

The examination fees for obtaining these certificates are fixed at 15 fr. per candidate examined.

The number of transmitting stations, in a given region, may be limited in consideration of the possibilities of interference with sets of the same kind.

ART. 12.—The conventions relative to stations of the third class provided for by paragraph 2 of Art. 10 above are drawn up, together with the specifications attached thereto, after consultation with the commission mentioned in Art. 8 of the present decree.

They determine in particular the technical, administrative and financial conditions governing the establishment and working of the station.

The technical clauses are determined in agreement with the Ministers under whose jurisdiction come the stations allocated to a public service. The financial clauses are determined in agreement with the Minister of Finances.

The Under Secretary of State for Posts and Telegraphs may under the same conditions conclude agreements for the use, outside of the hours of public service, of transmitting stations belonging to the State.

ART. 13.—The only types of waves which may be authorised are the following:

Continuous waves manipulated.

Continuous waves modulated by speech or by musical sounds.

Notwithstanding, in stations of the second class, all types of waves allowed by the international regulations are admissible for authorisation for such services as may eventually prove of an international character.

ART. 14.—The powers and wavelengths allowed for private wireless transmitting stations of the first, second, fourth and fifth classes, are to be within the following limits.

(a) *Stations of the First Class.*

Power proportional to the range and limited to 400 watts input; wavelength, 150 to 200 metres by telegraphy and by telephony. In the exceptional case of stations of this class being authorised to establish communications within a congested area the power is limited to 100 watts input with a wavelength between 125 and 150 metres; further, the height of the aerial above the ground must not exceed 30 metres.

(b) *Stations of the Second Class.*

Power proportional to the range and limited to 400 watts input; wavelength, 150 to 180 metres. Nevertheless, for stations which have to ensure communications of an international character the wavelengths will be determined in accordance with international regulations.

(c) *Stations of the Fourth Class.*

Power and wavelength fixed in each case according to the object in view.

(d) *Stations of the Fifth Class.*

Power limited to 100 watts input; wavelength, 180 to 200 metres.

Subject to the limits mentioned above, the technical characteristics of any private wireless transmitting station are determined after examination of the supporting documents supplied by the applicant with respect to the object in view, taking into account the international regulations, by the interministerial commission provided for in Art. 8 of the present decree.

These technical characteristics, moreover, remain subject to any restrictions rendered necessary by the public services.

ART. 15.—The following are forbidden:

1. All transmissions modulated by speech which are not in plain language and in French, unless specially authorised, after consultation with the interministerial commission mentioned in Art. 8.

2. All transmissions effected by special methods which do not permit of the reception and comprehension of the messages by means of receiving apparatus of a type approved by the Administration of Posts and Telegraphs.

ART. 16.—The Administration of Posts and Telegraphs exercises a permanent control over private wireless transmitting stations. The Agents of the Administration commissioned to exercise control shall have access to the transmitting station.

ART. 17.—Private wireless transmitting stations of the five classes are subject to a control tax of 100 fr. per year per kw. or fraction of kw. of power measured at the input. This tax is due for the whole year whatever be the date of putting the station into work. Any extraordinary expenses which may be specially incurred in the control of a private wireless station must be reimbursed by the licensee of the station.

ART. 18.—Stations of the first two classes are subject, furthermore, to a fee for the right of usage fixed for each transmitter (with the exception of spare transmitters) at 40 fr. per year per watt input.

The amount of the fee for right of usage applicable to the stations above-mentioned is payable from the day on which the stations are put into work. For the first year, however, it is calculated proportionally to the time to run up to December 31st; for subsequent years it accrues to the State for the full year from January 1st.

For temporary installations the duration of which is determined by the terms of the licence, the amount of the fee for right of usage is calculated proportionally to this duration.

The fee for right of usage is reduced to one-third for stations of the first class installed by

contractors for the distribution of power in virtue of the obligations imposed on them by the laws, decrees and regulations, and if intended exclusively to maintain the safety of the undertaking.

Special tariffs may be fixed by orders agreed upon between the Under Secretary of State for Posts and Telegraphs and the Minister of Finances for private wireless transmitting stations installed by Departments, Communes and public establishments and used for purposes coming within their competence, as well as for mobile stations communicating with the said transmitting stations.

CHAPTER III.

PROVISIONS COMMON TO PRIVATE RADIO-ELECTRIC STATIONS OF ANY KIND.

ART. 19.—Private wireless transmitting or receiving stations of every nature must be established, worked and maintained, by the licensees, at their own risk and expense.

The State will assume no responsibility on account of these operations.

ART. 20.—In international wireless relations fees for the right of usage are fixed after agreement with the foreign departments concerned.

ART. 21.—The authorisations granted carry no privilege, nor can they constitute any obstacle to similar authorisations which may subsequently be granted to any other applicant. They are issued without guarantee against any mutual disturbance which may be caused in consequence of the simultaneous working of other stations. They may not be transferred to third parties. Subject to the special clauses which may be inserted in the conventions provided for in Art. 12 of the present decree, all authorisations are revocable at any moment without indemnity by the Under Secretary of State for Posts and Telegraphs after consultation with the interministerial commission provided for in Art. 8 of the present decree and especially in the following cases :

1. If the licensee does not observe the particular conditions which have been imposed on him for the establishment and working of his station.

2. If he infringes the national or international regulations for the working and exploitation of wireless stations.

3. If he uses his set for purposes other than those provided for in the authorisation of the declaration, especially if he unduly picks up correspondence which he is not authorised to receive or if he violates the secrecy of those messages which he has fortuitously picked up.

4. If he causes interference with the working of public services using either radiotelegraphic or radiotelephonic systems or wired telegraphy or telephony over high and low frequency wires.

ART. 22.—Stations, wireless apparatus and installations may be provisionally seized by order of the Under Secretary of State for Posts and Telegraphs in any case where their use jeopardises public order and security or national defence or produces disturbance in wireless correspondence. This is definitely enacted by

decree after consultation with the interministerial commission provided for in Art. 8 of the present decree.

ART. 23.—All provisions contrary to those of the present decree, and particularly Art. 4 of the decree of May 15th, 1921, are, and remain, repealed.

ART. 24.—The Prime Minister, Minister of Foreign Affairs, the Ministers of Public Works, of War, of Marine, of the Interior and of Finance, are commissioned, each as far as he is concerned, with the execution of the present decree, which will be published in the *Journal Officiel*, and inserted in the *Bulletin des Lois*.

Given at Paris, November 24th, 1923.

A. MILLERAND.

By the President of the Republic.

The Prime Minister,

Minister of Foreign Affairs,

R. POINCARÉ.

The Minister of Public Works,

YVES LE TROCQUER.

The Minister of War,

MAGINOT.

The Minister of Marine,

RAIBERTI.

The Minister of the Interior,

MAURICE MAUNOURY.

The Minister of Finances,

CH. DE LASTEYRIE.

The Under-Secretary of State for Posts and Telegraphs,

Having seen the decree of November 24th, 1923, governing the establishment and use of private wireless stations ;

On the proposal of the Director of Telegraphic exploitation,

DECREES :

ART. 1.—The provisions of the decree of November 24th, 1923, governing the establishment and the use of private wireless stations shall come into force as from January 1st, 1924.

ART. 2.—Private wireless receiving stations declared before that date and included under the second class mentioned in Art. 2 of the decree of November 24th, 1923, shall only be subject to the annual royalty provided for in Art. 6 of the said decree as from January 1st, 1924.

The sums paid by way of statistical duty up to January 1st, 1924, for wireless receiving stations of any kind shall not give rise to reimbursement in favour of the licensees.

Private wireless transmitting stations authorised before December 31st, 1923, and coming into the first and second classes mentioned in Art. 8 of the decree of November 24th, 1923, shall only be subject to the royalty for right of use provided for in Art. 18 of the said decree as from January 1st, 1924.

ART. 3.—The present order shall be deposited in the Under Secretariat of State for Posts and Telegraphs (Central Service) to be notified to the proper quarter.

Given at Paris, on December 12th, 1923.

PAUL LAFFONT.

GAMBIA

(See Maps 24 and 26)

ADMINISTRATION.

THE rules governing the working of wireless telegraphy in this Colony will be found below.

A—Ordinance, September 22nd, 1913.

B—Schedule.

C—Rules under 1913 Ordinance.

A I. This Ordinance may be cited as "The Telegraphs Ordinance, 1913."

II. The words "telegraphy" and "telegraph" mean any system used for conveying transmitting or distributing electricity or any like agent for the purpose of communication from one point to another.

The expression "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

III. The Governor may, whenever he shall deem it expedient to do so, license the establishment of any telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in the Colony or Protectorate or on board any British ship registered in the Colony.

IV. (1) No person shall establish any telegraph station, or install or work any apparatus for wireless telegraphy, in any place in the Colony or Protectorate or on board any British ship registered in the Colony except under, and in accordance with, a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor in Council may determine and shall contain such terms, conditions and restrictions on any subject to which the licence is granted as the Governor shall consider desirable in the public interest.

V. (1) If any person establishes a telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding one hundred pounds or to imprisonment with or without hard labour for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for telegraphy installed or worked without a licence; but no proceedings shall be taken against any person under this section except with the sanction of the Legal Adviser to the Governor.

(2) If the Chief Magistrate, the Police Magistrate, or a Justice of the Peace is satisfied by information on oath that there is a reasonable ground for believing that a telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any part or on board any ship within the jurisdiction without a licence in that behalf, he may grant a search warrant to any Police Officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used, or intended to be used, for telegraphy therein.

VI. (1) The Governor in Council may amend, vary or revoke any of the regulations contained in the Schedule to this Ordinance, and may make regulations for all or any of the following matters:—

(i) Prescribing the form and manner in which applications for licences under this Ordinance are to be made;

(ii) Prescribing the fees payable on the grant of any licence;

(iii) Prohibiting or regulating the use of telegraphy in such telegraph stations, or of wireless telegraphy on board such ships while in such waters, by such further rules

as the Governor-in-Council may see fit to make from time to time, and either in all cases or in such cases as may be deemed desirable, if at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over telegraph stations or over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Colony.

(2) Provided that no regulations made in respect of the provisions in this section contained shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

VII. When an applicant for a licence proves to the satisfaction of the Governor that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for the purpose shall be granted subject to such special terms, conditions and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

VIII. (1) Every omission or neglect to comply with, and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulation made thereunder, or in breach of the conditions and restrictions subject to, or upon which any licence has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding fifty pounds or to imprisonment with or without hard labour for a term not exceeding six months.

(2) All convictions, forfeitures and fines under this Ordinance or any regulations made thereunder may be had and recovered before a Court of Petty Sessions.

IX. Nothing in this Ordinance contained shall invalidate or impair any agreement now in force entered into between the Governor of this Colony, or the Imperial Government on behalf of the Government of this Colony, and any telegraph company, relative to the laying down or landing of any telegraphic cable, the removal, renewal, maintenance and use thereof, or to the payment of any subsidy to such company by the Government of this Colony or any other like matter.

X. Nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

XI. The Telegraphic Establishments (Maintenance of Control) Ordinance 1903 is hereby repealed.

To this Ordinance is attached a Schedule which runs:—

THE SCHEDULE.

B 1. All apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the territorial waters of the Colony shall be worked in such a way as not to interfere with (a) naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial

waters thereof, or in the Protectorate, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, shall be worked or used whilst such ship is in any of the harbours of the Colony or Protectorate except with the special or general permission of the Governor.

3. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

It will be noted that under Section VI of this Ordinance the Governor-in-Council has power to make regulations. Of those which His Excellency has accordingly promulgated under date of the 28th January, 1914, the text runs as follows —

RULES MADE BY THE GOVERNOR-IN-COUNCIL UNDER SECTION VI OF THE TELEGRAPH ORDINANCE, 1913.

C 1. These rules may be cited for all purposes as "The Telegraph Rules, 1914."

2. The expression "the Company" shall mean any company, corporation or person for the time being engaged in the Colony or Protectorate of the Gambia in transmitting or receiving telegrams.

3. If and whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that the Government of the Colony and Protectorate of the Gambia shall have control over the transmission of telegrams by the Company, it shall be lawful for the Governor by warrant under his hand to direct and authorise such persons as he may think fit to assume the control of the transmission of telegrams by the Company either wholly or partly and in such manner as he may direct, and such persons may enter upon the Company's premises accordingly or the Governor may direct the Company to submit to him or any person authorised by him all telegrams tendered for transmission or received by the Company or any class or classes of such telegrams, and to stop or delay the transmission of any telegrams or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of telegrams as the Governor may prescribe, and the Company shall obey and conform to all such directions.

Provided always that if default shall be made by the Company in the observance or per-

formance of any provision hereinbefore contained it shall be lawful for the Governor by warrant under his hand to direct and cause so much of the Company's works as are in the Colony or Protectorate of the Gambia or any part of such works to be taken possession of for such services as to the Governor may seem fit, and in that event any person authorised by the Governor may enter upon the offices and works of the Company or any of them and take possession thereof and use the same as aforesaid. Nothing herein contained shall be deemed in any way to prejudice or abridge the power of the Government of the Colony and Protectorate of the Gambia to take possession under or by virtue of any agreement for the time being in force.

4. In any such case as aforesaid if the Company show that during the exercise of any of the powers aforesaid their receipts from the telegraphs with respect to which the said powers have been exercised have been less than their receipts from the same source during a corresponding period on the average of the last three years preceding the Government of the Colony and Protectorate of the Gambia shall pay to the Company as compensation for any loss of profit sustained by the Company by reason of the exercise by the Governor of any of the powers hereby reserved such sum as may be settled between the Governor and the Company by agreement or as in case of difference may be determined by arbitration. Provided always that no such compensation as aforesaid shall be paid if and so far as the powers hereby reserved to the Governor are exercised for the purpose of preventing direct communication with any of His Majesty's enemies, and save with the consent of the Governor no such compensation shall be paid if and so far as the powers aforesaid are exercised for the purposes of preventing indirect suspected communication with any of His Majesty's enemies or of protecting the interests of His Majesty under the apprehension of impending war.

5. In estimating such compensation as in the preceding section provided the Arbitrator shall take into account all the circumstances of the case, including not only any such loss as aforesaid but also any additional profit accruing to the Company from the emergency which gave rise to the exercise of the powers aforesaid, and as regards the telegraphs with respect to which the said powers have been exercised the receipts of the Company on the average of the last preceding three years during a period corresponding to that of the exercise of the said powers shall be deemed to be the receipts which the Company would have taken during the period of the exercise of the said powers had the powers not been exercised.

GERMANY

(See Maps 2 and 8).

CONTROL.

WIRELESS Telegraphy in the German Republic is a monopoly of the State and is controlled by the Imperial Postal Administration which is divided among various departments under the supervision of the Postmaster-General of which Department III attend to questions of equipment, administration, communication and management, while technical matters are undertaken by Department IV.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Höfl	Minister of Posts	Berlin.
Dr. Eng. Hans Bredow	Secretary of State	Berlin.

ORGANISATION.

Wireless communication with distant countries is carried on by the long range stations at Nauen and Eilvese, which maintain correspondence with the United States, Central and South America, Asia, Australia, Russia, Spain and Egypt. The station at Königswusterhausen maintains traffic with Great Britain, Hungary, Bulgaria, Serbia, Lettonia, Esthonia, Austria, Roumania and Italy, while traffic with Holland is mainly conducted by the station at Hanover.

The Wireless Station at Nauen is owned by Transradio Aktiengesellschaft für drahtlosen Übersee-Verkehr and that at Eilvese by the Eilvese G.m.b.H. both being under the superintendence of the State. Königswusterhausen is owned and operated by the Imperial Telegraphs Administration and it is from this station that Financial and Industrial news is broadcast. There are 29 coast stations for general traffic with ships at sea.

Several large News Agencies, by arrangement with the German State Post Office, broadcast news items at stated times. Concerts and entertainments are broadcast from Berlin, Breslau, Frankfurt-on-Main, Hamburg, Königsberg, Leipzig, Munich, Munster and Stuttgart by private Companies who receive a proportion of the annual fee of 24 marks charged for a receiving licence. Broadcast valve receivers must comply with specific technical conditions and be only tunable to wavelengths of 250 to 700 metres. After being approved by the Post Office they are stamped RTV (Reichstelegraphenverwaltung). Crystal Detectors need not be tested and stamped. Experimental Receiving Licences, permitting the use of valve receivers with longer range of wavelengths and not requiring the RTV stamp, are issued to persons having a certain degree of technical knowledge, Experimental Transmitting Licences are also issued to approved applicants. (See E, F, and G below).

ADMINISTRATION.

We print below the Laws and Regulations at present in force, together with the various forms of licence issued by the State Postal and Telegraph Department.

A—Law of March 7th, 1908, Modifying the Telegraph Act of April 6th, 1892.

B—Regulations, under above law (Foreign Ships).

C—Decree, dated March 8th, 1924, for the Protection of Radio Traffic.

D—Form of Licence and conditions for Private Receiving Stations.

E—Conditions for obtaining Experimental Licences.

F—Form of Licence and Conditions for Experimental Valve Receiver.

G—Conditions for erecting and Operating Experimental Transmitting Stations.

H—Licence for the Manufacture, Sale and Demonstration of Broadcast Receiving Sets and Component Parts.

I—Manufacturers Licence for Experimental Valve Receiver.

J—Licence for Wireless Receivers for Newspapers and News Agencies.

K—Conditions for granting Licences for Ship Stations.

L—Conditions for Installing and Operating Wireless Installations on Aeroplanes.

M—Conditions for Erecting and Operating Stations for Reception of Nauen Time Signals.

N—Conditions for erecting and Operating Transmitting and Receiving Apparatus in Power Stations, Waterworks, etc.

LAW. MARCH 7TH, 1908.

Sole Article.—The Act of April 6th, 1892, relating to telegraphs in the German Empire is modified as follows:

1. Article 3 is completed by the following paragraph (2):—

Installation of electric telegraphs for transmission of messages without the aid of metallic wires of junction shall not be established and worked except with the authorisation of the State.

2. The following provisions are inserted after Article 3:—

(3a) Telegraphic installations which are not exclusively designed for the internal service of a ship cannot be established and worked on German vessels unless authorised by the State.

(3b) The Imperial Chancellor shall decree the regulations concerning the working of telegraph stations on board foreign vessels in German territorial waters.

3. Article 7 is completed by the following paragraph (2):—

The provision of Paragraph 1, Phrase 1, does not apply till July 1st, 1913, to installations of the nature defined in Article 3, Paragraph 2.

REGULATIONS.

B The following regulations are decreed for the working of telegraphic installations on board foreign ships in German territorial waters, and are founded on Article 3 (b) of the "Telegraph Law of the German Empire," of April 6th, 1892, and March 7th, 1908, and under the reservation of Article 15 of this law:—

1. Ships of war are authorised, in a general manner—

(a) To exchange messages, signals, by means of optic and acoustic signals, submarine acoustic signalling excepted.

(b) To use wireless telegraphy, on condition that they do not disturb the radiotelegraphic service of the public coast stations, or the service of the coast or ship stations of the Imperial Navy.

In exchanging messages with German or foreign radiotelegraphic stations, foreign vessels must conform to the regulations of the "Decree for the Regulation of the Radiotelegraphic Service" and to the Decrees which may ultimately be promulgated.

2. Foreign vessels other than ships of war are authorised—till otherwise decreed—

(a) To exchange messages by means of optic and acoustic signals, submarine acoustic signalling excepted, and under the reservation that within the illumination zone of the navigable waters of the German coasts and islands the lights of the signal protectors or lanterns must not exceed that prescribed for fixed lights.

(b) To use wireless telegraphy in conformity with the provisions of the "Decree Regulating the Radiotelegraphic Service" and the decrees which may ultimately be promulgated; nevertheless, in the ports, roadsteads, and estuaries, and in the navigable waterways of the interior, wireless telegraphy can only be used on an authorisation being granted in writing by the Ministry

of Posts and Telegraphs of the German Empire.

3. In the public interest the Articles 1 and 2 may be temporarily restricted or suspended.

4. Whosoever works telegraphic installations in a way not authorised by the preceding provisions is liable to fines determined in Article 9 of the "Law of Telegraphs," and in virtue of Article 46 of the Penal Code of the German Empire all the apparatus designed for the transmission of wireless messages can be confiscated. Moreover, installations which have been worked without a licence can be, in conformity with Article 11 of the "Telegraph Law," removed or rendered unserviceable.

DECREE OF THE 8TH MARCH, 1924, FOR THE PROTECTION OF RADIO TRAFFIC

C In virtue of Article 48 of the State organisation I decree as follows for the purpose of re-establishing public security and order in the country:—

1. Transmitting and receiving devices (radio apparatus) of any kind which are suitable to transmit or receive news, signals, pictures or music by electric means without connecting lines or by electric oscillations carried by a line, provided it is not a question of installations for State defence, may only be installed or worked with the consent of the State Telegraph Administration. The provisions of Clause 2 of the Law respecting Telegraphs of the 6th April, 1892, 7th March, 1908 (State Law Sheet 1892 page 467, 1908, page 79) are applicable as regards this licence, with the proviso that the granting of the licence is not necessarily a right.

2. Anyone knowingly erecting or working a radio plant (Clause 1) contrary to the provisions of this decree shall be punished by imprisonment. Experimenting is punishable.

3. Anyone who has erected an electric telegraph plant, which transmits news without connecting lines (Clauses 1 and 3, Section 2 of the Law respecting Telegraphs of the 6th April, 1892, 7th March, 1908 (State Law Sheet 1892, page 467, 1908 page 79), or who has installed a radio plant in the sense of Clause 1 of this decree without the consent of the State Telegraph Administration or who works it without this permission but applies to the State Telegraph Administration for the licence within four weeks of the coming into force of this decree is not liable to punishment, provided the acts which are punishable according to Clause 9 of the Law respecting Telegraphs or according to Clause 2 of this Decree were committed before the lodging of the application.

4. (1) Articles which have been used or intended for the commission of a breach against the provisions of Clause 9 of the Law respecting Telegraphs of the 6th April, 1892, 7th March, 1908 and Clause 2 of this decree, shall be confiscated by the State (State Telegraph Administration), no matter to whom the articles belong or whether steps are taken to punish any particular person.

(2) The confiscation shall be pronounced by sentence. By the legal force of the sentence the ownership of the confiscated articles passes over to the State (State Telegraph Administration). Rights of third parties lapse. With regard to an acquisition of right which occurs after the

validity of the judgment comes into legal force the provisions of the civil law hold good in favour of those who derive the rights from a non-authorised person.

5. (1) The officials of the State Attorney's Office and the police can at any time enter the premises where radio plants are or are presumed to be (Clause 1) for the purpose of inspecting the plants and searching the premises, if it is suspected that some action which is liable to punishment—such as referred to in Clause 2—is taking place. It is not necessary for an order to be made for the inspection by the judge. The conditions respecting criminal proceedings relating to the searching of premises in military service buildings remain unaffected.

(2) Officers of the State Postal Telegraph Administration are empowered to participate in inspections and searches that are made according to Section 1, paragraph 1.

6. (1) The Police must put out of working or remove telegraph sets which have been installed or worked without authority (Clause 1 of the Law respecting Telegraphs of the German State of the 6th April, 1892, 7th March, 1908 as likewise unauthorised Radio sets (Clause 1 of this Decree). Previous warning is not necessary. For the rest the provisions of the country's legislature hold good for the application of police-coercive measures as well as for the legal means of redress with respect to these measures. If application for licence should subsequently be made for the erection and working of the installation, the police can—with the consent of the State Telegraph Administration—refrain from putting out of action or removing the installations until the decision is given with regard to the request for the licence.

(2) The police can in official protection take or otherwise secure all or the individual parts of an installation put out of working or removed in accordance with the foregoing paragraph. The restraint ceases to be in force, when by legal mode of procedure (Section 1 paragraph 3) the putting out of action or removal of the plant is validly cancelled. The provisions as regards criminal proceedings for restraint, as well as those for confiscation mentioned in Clause 4, remain unaffected.

(3) The provisions contained in the foregoing paragraphs are also applicable to installations which have been licensed, but which are not put out of working or removed within the period fixed by the State Telegraph Administration after withdrawal of the licence.

7.*

8. The provisions of the law relating to Telegraphs of the German State of the 6th April, 1892 as modified by the Law of the 7th March, 1908 remain unaffected, provided nothing different is stipulated in this decree.

9. This decree comes into force simultaneously with its publication.

Berlin, 8th March, 1924.

The State President, EBERT.

The State Chancellor, MARX.

The State Minister of Interior, Dr. JARRES.

The State Postal Minister, Dr. HOFFE.

The State Minister of Justice, EMMINGER.

LICENCE.

D FOR THE ERECTION AND WORKING OF A RADIO RECEIVING INSTALLATION FOR PRIVATE USE.

for
in Street.....

*Note.—Clause 7 has not been translated, as it has been subsequently cancelled by a Decree dated 24th July, 1924.

valid under the following conditions, provided the fee is paid to the Post Treasury. The minimum period of the obligatory fee is one year. The licence tax of...mks. per month has been paid; further taxes will be collected by the delivery Post Office, to which Office changes of address are to be immediately notified.

ON BEHALF OF THE GERMAN STATE POST OFFICE.
Post Office. (Date stamp).

CONDITIONS.

I.—GENERAL.

1. The installation shall be for the reception of "Entertainment Broadcasting" and "News for all."

2. It is forbidden to receive other radio traffic or to disturb Telegraph, telephone and radio installations.

3. The holder of the licence is responsible in respect of anyone who uses his installation, and must not transfer the licence to third parties; he must allow representatives of the German State Post Office (DRP) access to the premises and grounds where the receiving installation is; after the expiration of the licence he must remove his installation and return the licence deed to the delivery Post Office.

4. Any breaches against these regulations—which are not liable to punishment according to the Decree for the protection of radio traffic of the 8th March, 1924—may occasion the withdrawal of the licence.

5. The licence may be revoked.

II.—AERIAL.

1. The maximum length of the wire used by the receiver must not exceed 100 m.

2. Any permit which it may be necessary to obtain from the owners of buildings, Police Administrations, etc., is exclusively a matter for the holder of the licence.

3. In the event of causing disturbance or hindrance to the development of public telegraph or telephone installations the aerial is to be removed at the expense of the holder of the licence deed.

4. The fixing of aerials to the supports of the public telegraph and telephone system without the consent of the D.R.P. (=German State Post Office) is inadmissible. In the event of the erection being undertaken without reference to the D.R.P. it must be done at a distance from the latter's lines of at least 1 m.

5. No crossings are allowed between aerial and high tension lines; where they are adjacent there must be no possibility of their coming into contact even in the case of breakage; the horizontal distance apart must in no case be less than 10 m. It is likewise prohibited to cross bare low tension lines and telegraph and telephone lines simultaneously with an aerial.

III.—RECEIVING DEVICES.

The following may be used:—

1. Apparatus approved by the D.R.P. and bearing the stamp R.T.P. (including auxiliary apparatus and valves).

2. Self-constructed or unstamped detector receiving devices which have been bought ready made without receiving or amplifying valves.

The stamped apparatus shall possess the following characteristics:—

(a) Waverange from 250 to 750 m;

(b) No oscillation generation, not even with increased heat or anode tension.

Alterations in stamped apparatus and its accessory parts or the connecting up of any

parts whatever serving the purpose of altering the waverange or for making the apparatus produce oscillations—are prohibited.

Anyone using unstamped apparatus in cases where only stamped apparatus should be used is liable to punishment as contravening these regulations. (See under No. 4).

CONDITIONS FOR OBTAINING AN EXPERIMENTAL LICENCE FOR VALVE RECEPTION.

E 1. Proof of previous wireless technical training must be produced before a Committee consisting of:—

1. Two technical experts of the Association appointed by the latter.

2. One representative of the D.R.P. (= German State Post Office) nominated by the competent Department of the Chief Postal Direction after consultation with the Association. If the said representative is prevented from attending, he can have particulars of the result of the examination together with the report of the members of the Committee sent to him.

3. If possible one representative of the German Wireless Federation; the latter may also nominate a member of the Association.

On the members of the Committee and their representatives being nominated, the Association shall apply to the competent Department of the Chief Postal Direction recommending that the Committee according to the specified nomination should be recognised. The Committee is only empowered to begin its activities after due recognition.

In the event of an equality of votes of the members of the Committee, proof shall not be considered as having been established.

If the representative of the D.R.P. as in the case mentioned in Paragraph 1, section 2, sentence 2—should also be in a minority as regards holding the opinion that the application should be refused, the matter may be referred for decision to the Telegraph Technical State Office, which after consultation with the German Wireless Federation, shall give the final decision.

II. The proof shall embody:—

1. Personal qualifications, the following requisites being necessary:

(a) Membership of the Association.

(b) Residence within the province of the Association.

(c) German Nationality; foreigners may be granted a permit as soon as it is notified by the D.R.P. (=German State Post Office) that the respective country acts in a reciprocal manner.

(d) The member according to who he may be must give an assurance that he will not in any way prejudice the efforts being made for the furtherance of wireless.

2. General, technical and especially electro-technical knowledge, in so far as it is necessary for the technical working of wireless.

3. Technical knowledge respecting wireless, in so far as it is requisite for the understanding of the assembling of the individual parts of a wireless receiving apparatus.

4. A knowledge of the organisation of German wireless and in particular of wireless telephonic communications, in so far as it may be necessary in order to recognise disturbances which may arise through careless experimenting.

III. If, in the opinion of the Committee, the member should fulfil all the preliminary conditions and possess the special knowledge requisite for working with audion and back-

coupling for preventing the generation of oscillations, the valve experimental permit may be granted to him (Encl. 1A).

CONDITIONS FOR OBTAINING AN EXPERIMENTAL PERMIT FOR CRYSTAL DETECTOR.

The Association can furnish any member—who complies with the personal provisions—with a permit for trials with self-constructed or unstamped detector receiving devices which have been bought ready made without receiving or amplifying valves by the handing over of a licence issued by the D.R.P. (=German State Post Office) for participation in Entertainment Broadcasting.

There is no minimum age for obtaining a valve or Detector (Crystal, etc.) permit through the medium of the Association.

EXPERIMENTAL LICENCE FOR VALVE RECEPTION

F For the installation and working of one wireless receiving set for private use.

For
inStreet.....
Association
valid under the following conditions, provided the fee is paid to the Post Treasury. The minimum period of the obligatory fee is one year. The licence tax ofmks. per month has been paid; further taxes will be collected by the delivery Post Office, to which Office changes of address are to be immediately notified.

ON BEHALF OF THE GERMAN STATE POST OFFICE.

Granted on the192.....
(Date stamp)

CONDITIONS.

I.—GENERAL.

1. The installation shall be for the reception of "Entertainment Broadcasting" and "News for all."

2. It is forbidden to receive other radio traffic or to disturb telegraph, telephone and radio installations.

3. The holder of the licence is responsible in respect of anyone who uses his installation, and must not transfer the licence to third parties; he must allow representatives of the German State Post Office (D.R.P.) access to the premises and grounds where the receiving installation is; after the expiration of the licence he must remove his installation and return the licence deed to the delivery Post Office.

4. Any breaches against these regulations—which are liable to punishment according to the Decree for the protection of radio traffic of the 8th March, 1924—may occasion the withdrawal of the licence.

5. The licence may be revoked.

II.—AERIAL.

1. The maximum length of the wire used by the receiver must not exceed room.

2. Any permit which it may be necessary to obtain from the owners of buildings, police administrations, etc., is exclusively a matter for the holder of the licence.

3. In the event of causing disturbance or hindrance to the development of public telegraph or telephone installations the aerial is to be removed at the expense of the holder of the licence.

4. The fixing of aerials to the supports of the public telegraph and telephone system without the consent of the D.R.P. (=German State Post Office) is not allowed. In the event of the erection being undertaken without reference

to the D.R.P. it must be done at a distance from the latter's lines of at least 1 m.

5. No crossings are allowed between aerial and high tension lines; where they are adjacent there must be no possibility of their coming into contact even in the case of breakage; the horizontal distance apart must in no case be less than 10 m. It is likewise prohibited to cross bare low tension lines and telegraph and telephone lines simultaneously with an aerial.

III.—RECEIVING DEVICES.

Holders of the valve experimental permit may use all kinds of arrangements for reception, even self-constructed devices, provided the following provisions are observed in accordance with the general principles of the Wireless Amateurs' Association.

1. At the times during which the German Entertainment Broadcasting transmitters are generally working within range of the receiving set, trials with back-coupling may only be made, provided no generation of oscillations is set up in consequence. The competent Department of the Chief Postal Direction shall fix the times for which this limitation shall be in force after consultation with the transmitting Companies; these times may be ascertained by enquiry at any Post Office. The special local provisions of the D.R.P. (=German State Post Office) for the protection of wireless news traffic are likewise to be complied with.

2. Only receiving and amplifying valves bearing the stamp or band R.T.V. (=State Telegraph Department) may be used.

3. If any alteration or addition of parts is made to the apparatus which the D.R.P. (German State Post Office) has approved and stamped for broadcasting subscribers of such a nature as to alter the waverange or to produce oscillations in the apparatus, the stamp of the D.R.P. shall be cancelled.

CONDITIONS FOR THE ERECTION AND WORKING OF TRANSMITTING AND RECEIVING INSTALLATIONS FOR WIRELESS TECHNICAL EXPERIMENTAL PURPOSES.

G 1. A licence for the erection and working of the wireless installation in
is granted to Mr.
the firm of

in Street.....
on the following conditions.

2. A certificate testifying that the conditions of working of the installation in question have been tested by the German State Post Office is attached to the licence deed and must bear the signature of the holder (licence holder) of the installation in acknowledgment of this. The installation may only be erected and worked in accordance with this certificate. No deviations from the specifications contained in the respective certificate may be made without the approval of the D.R.P. Any alterations which may subsequently be necessary in the provisions agreed to on the respective certificate with regard to consumption of energy, wavelengths used, call signals and hours of service, etc., will be fixed after hearing the general holder and must be adhered to.

3. Whenever—for the purpose of crossing public roads and places with aerial wires or fixing supports on other people's property—it may be necessary to obtain the consent of those entrusted with the upkeep of the roads and those owning or otherwise participating in the ownership of the grounds traversed or used the obtaining of the permission is purely a matter which concerns the licence holder.

4. The installation may only be used for carrying out wireless tests and for forwarding messages in connection with these tests. The transmission of other news is not allowed, whether paid for or free. The reception of news from other wireless stations, with the exception of entertainment Broadcasting and "news for everybody" (CQ) is not allowed. Entertainment broadcasting may only be picked up in carrying out technical experiments. Any extraneous wireless traffic that may be overhead may not be written down, divulged or utilised in any way. The licence holder shall be personally responsible for having his wireless installation examined for this purpose and prevent its being used by unauthorised persons.

5. Only such energy is to be used for transmission as is absolutely necessary for the accomplishment of the purpose in view. The wave must be as sharply tuned as possible in accordance with the modern technical standards.

6. The telegraphic and telephonic traffic (by wire or wireless) of the D.R.P. (=German State Post Office) and other Federal and State authorities, as well as the traffic of private installations already permitted before the granting of the present licence, may not be disturbed.

7. In the event of public telegraph or telephone installations being interfered with or their development being impeded, the installation must be modified at the expense of the licence holder.

The fixing of aerials to supports of the public telegraph and telephone system without the consent of the D.R.P. (=German State Post Office) is not allowed. In the event of the erection being undertaken without reference to the D.R.P., it must be done at a distance from the latter's lines of at least 1 m.

No crossings are allowed between aerial and high tension lines; where they are adjacent there must be no possibility of their coming into contact; even in the case of breakage; the horizontal distance apart must in no case be less than 10 m. It is likewise prohibited to cross bare low tension lines and telegraph and telephone lines simultaneously with an aerial.

8. The officials of the D.R.P. are entitled to enter the premises and grounds in which the wireless installations or their parts are situated, and to take cognisance of the devices used for the carrying out of the tests, as well as of the experiments themselves.

9. The licensee is responsible for any damage which may be caused to the State or to third parties by the working of the wireless installation, in accordance with the legal provisions.

10. Instructions given by the D.R.P. (=German State Post Office) to stop working temporarily must be complied with without delay. During the cessation the wireless apparatus or parts are to be sufficiently dismantled so as to preclude the possibility of the set being used. The decision regarding this matter rests with the D.R.P.

11. Application must be made for a special licence to the Chief Postal Direction for demonstrating receiving apparatus for trade purposes and for the purposes of manufacturers of broadcasting receiving apparatus.

12. The licence holder is obliged to pay an annual tax of gold marks.

13. In the event of a breach against the foregoing provisions the licence may be withdrawn. This does not affect the licence holder's obligation to pay the taxes referred to in No. 12.

14. The right is reserved to revoke the licence or to supplement or modify the foregoing

conditions. The licence holder is bound to comply immediately with any alteration of or addition to the conditions.

All expenses arising from a modification of the conditions, whether in connection with technical alterations of the wireless equipment or in any other respect, has to be borne by the licence holder.

The licence may not be transferred to third parties.

Acknowledged :

....., the.....192.....
.....
..... Signature.

MANUFACTURER'S LICENCE.

H A LICENCE FOR THE OPERATION OF A WIRELESS RECEIVING INSTALLATION FOR DEMONSTRATING RECEIVING APPARATUS (FOR THE PURPOSES OF MANUFACTURE OF BROADCASTING RECEIVING APPARATUS) IS GRANTED, SUBJECT TO ITS BEING REVOCABLE TO :

Mr.
The firm of
in Street
in accordance with the provisions of the valve experimental permit and on the following special conditions for Germany (excluding Bavaria) — with respect to manufacturing.

I.—MANUFACTURE OF BROADCASTING RECEIVING APPARATUS.

1. The German State Post Office (D.R.P.) will—in accordance with Enclosure B—test the receiving apparatus manufactured by the firm which complies with the special technical conditions of Enclosure A and affix the stamp “R.T.V.” (State Telegraph Administration) to it, in virtue of which it is sanctioned by the D.R.P. (German State Post Office) in the sense of the conditions for broadcasting subscribers (“broadcasting receivers”). Apparatus in pieces (experimenter's cases) may also be tested and stamped, provided the apparatus after being assembled satisfies the provisions for broadcasting receivers.

2. As contribution towards the expenses of the broadcasting transmitters which have to be erected and operated by the D.R.P. the firm pays the D.R.P. a tax of 2,500 mks. after being granted the above licence; of this amount 1,000 mks. is in all cases to be paid immediately; the D.R.P. may defer the claim for the balance after hearing the firm.

3. Every broadcasting receiver which has been assembled must be tested before it leaves the workshops by special officers of the D.R.P. as to its admissibility (conformity with the relative sample, etc. submitted to the D.R.P.) and provided with the stamp “R.T.V.” as a sign of approval. Special amplifying apparatus and all accessory parts procured for the working, which may alter the waverange or produce oscillations, as likewise all valves, must bear the stamp or band “R.T.V.”

Broadcasting apparatus must also be provided with an indication of the manufacturing firm and a printed sign. Apparatus of the same type must in no way differ from each other, especially from the type of sample tested and approved by the D.R.P. (German State Post Office). Alterations—even of an insignificant nature—with respect to the type of sample approved may only be made, after the consent of the D.R.P. has been obtained.

There is no obligation for the D.R.P. to test and stamp the apparatus within a specified time. The firm is not entitled to make any claim for compensation against the D.R.P. on account

of any prejudice caused to it owing to delayed stamping of apparatus.

The supplying firm must pay taxes to the D.R.P. in respect of the testing and stamping of broadcasting receiving apparatus and spare parts, which amount is regulated according to the method of execution.

The taxes are as follows :—

	Gold mks.
For a Detector Receiver without amplifier	1.25
For a Detector Receiver with amplifier..	1.75
For a Valve Receiver without amplifier ..	3.00
For a Valve Receiver with amplifier ..	3.50
For a Receiving or Amplifying Valve ..	0.50
For an Amplifier (high or low frequency)	
each stage	0.50
For any other Accessory Apparatus (each)	0.50

The relevant taxes which are due on the date the apparatus is stamped must be paid by the firm immediately—at the latest 14 days after receipt of the demand notice—to the office specified of the competent Department of the Chief Postal Direction. If payment is not punctually made, the D.R.P. (German State Post Office) will suspend any further acceptance and stamping of apparatus, the firm's obligation to pay the amount in question will not, however, be affected in consequence.

5. By the fact of testing and stamping the broadcasting receiving apparatus and spare parts, the D.R.P. does not in any way undertake to guarantee their good working, nor still less, that there have been no patent, infringements in the manufacture of the receiving apparatus and spare parts. The D.R.P. declines on principle to take part in any question relating to patents. On the other hand the respective supply firm and all other quarters responsible according to the Patent right conditions have to answer for all the consequences arising from any patent infringements. The latter have also to represent the D.R.P. in respect of any claims addressed to it in this connection.

6. In the event of the lapsing or withdrawal of the licence (see II, paragraph No. 6), the contribution made to the D.R.P. by the firm referred to in paragraph No. 2 is not refunded either wholly or in part.

II.—WORKING OF A WIRELESS RECEIVING INSTALLATION FOR DEMONSTRATING RECEIVING APPARATUS.

1. Trade in separate parts, may be carried on, except that it is only permissible to stock and sell receiving and amplifying valves separately or as parts of apparatus (see under 2) which bear the stamp or band “R.T.V.”

2. The following is applicable as regards finished apparatus—amongst which are to be similarly regarded as such—nearly finished apparatus and groups of apparatus parts, which according to the method of experimenters' cases, can be immediately assembled :—

(a) Finished apparatus and experimenters' cases bearing the “R.T.V.” stamp—likewise finished detector receiving devices without receiving or amplifying valves not bearing a stamp—may be sold to broadcasting subscribers proving their identity by production of the licence deed. No indication of the number, etc. of the apparatus on the licence deed is necessary.

If a purchaser is not yet in possession of this document, such apparatus may be sold, on condition that the seller ascertains the name and address of the purchaser and sends a request on a post card to the relevant delivery post office

for the purchaser for a licence deed to be issued for the purchaser which must be signed jointly by the selling firm and the purchaser.

(b) All kinds of apparatus may be sold to holders of the valve experimental permit, provided the experimental permit deed of the German State Post Office (D.R.P.) is produced by the buyer.

(c) Every kind of finished apparatus may be sold forthwith to persons or firms to whom the D.R.P. (German State Post Office) has granted the licence for demonstrating receiving apparatus and who produce this document. The sale of apparatus bearing the stamp "R.T.V." to other intermediaries is not allowed.

(d) Apparatus may be sold for export without limitation, provided the seller is convinced after careful inquiry that export will actually be effected. If valves are exported, bands are not necessary; on being requested the Chief Postal Direction at the place where the export firm is situated will duly notify the Chief Postal Direction at the place where the valve factory is situated.

3. In the case of apparatus stamped "R.T.V." = (State Telegraph Administration) by the D.R.P. = (German State Post Office), besides the designation of the constructing firm and the type, the title, etc., of a retail dealer may also be affixed to it. The designation of the manufacturer is not required by the D.R.P., if instead of this, a distinguishing sign approved by the Telegraph Technical State Office, after hearing the manufacturer, is affixed to the apparatus. In such cases the name of the manufacturer must be clearly shown inside the apparatus.

4. In the case of apparatus bearing the stamp "R.T.V." the D.R.P. is entitled to make casual tests in order to ascertain that the special conditions for this apparatus are being adhered to.

5. The holder of this licence is bound to advise his purchasers only in the sense of the provisions prescribed by the D.R.P. for broadcasting receiving installations and must do his utmost in every way to see that these conditions are adhered to; in particular it should be pointed out that wireless installations may only be erected and operated under licence from the D.R.P. and that any contraventions are punishable.

6. The licence may be withdrawn:—

(a) In the event of the conditions being contravened;

(b) for any other reason of apparent importance to the D.R.P.

7. The licence holder has to pay a regular tax every month of 30 mks.; which tax is collected in advance monthly by the postman. The minimum duration for liability to tax is one year. The licence lapses according to the regulation on the front of the valve experimental permit deed, if the taxes fixed by the D.R.P. (German State Post Office) are not punctually paid.

8. This licence may not be transferred to third parties without the consent of the D.R.P.

9. Any addition to or alteration of the foregoing conditions is expressly reserved. If any such alterations should affect the technical equipment of the receiving apparatus a reasonable period of time will be fixed for the carrying out of these alterations.

The firm has to bear all expenses incurred by alterations of the conditions.

10. The firm has to bear the cost of stamping or any other expenses which may be occasioned in the preparation of the licence.

Berlin W 66.....192.....
(Stamp of the State Postal Ministry).

MANUFACTURER'S EXPERIMENTAL LICENCE FOR VALVE RECEPTION.

A-LICENCE

FOR THE OPERATION OF A WIRELESS
RECEIVING INSTALLATION FOR DEMON-
STRATING RECEIVING APPARATUS (FOR
TRADE COMMERCIAL PURPOSES) IS
GRANTED, SUBJECT TO ITS BEING REVOCABLE, TO

Mr. of
..... Street

the firm of.....
in accordance with the conditions of the Valve
Experimental Permit and on the following
special conditions:—

(Here follow the conditions 1 to 10, which are
identical to paragraphs numbered 1 to 10 under the
heading of "Working of a Wireless Receiving
Installation for Demonstrating Receiving
Apparatus." (See under J).)

(Here is Service Stamp of the Chief Postal
Direction.)

LICENCE

J FOR THE ERECTION AND WORKING OF
WIRELESS RECEIVING INSTALLATIONS
FOR NEWSPAPERS AND NEWS AGENCIES.

1. A licence for the erection and working of
the wireless telegraph installation.....

..... is granted to.....
of.....
subject to the express reservation that it may be
revoked at any time.

This licence may not be transferred to anyone
else. If..... passes into
other hands, the State Telegraph Administration
(RTV) must be immediately informed; if the
wireless set is to be maintained application must
be immediately made for a licence to be granted
to the assign.

2. A certificate testifying that the conditions
of working of the installation in question have
been tested by the RTV is attached to the
licence deed, and must bear the signature of the
holder (licence holder) in acknowledgment of
this. The installation may only be erected and
worked in accordance with this certificate. No
deviations from the specifications contained in
the certificate may be made without the consent
of the R.P.M. (= State Postal Ministry).

The R.T.V. decides on the kind of wireless
apparatus that shall be used.

3. Whenever—for the purpose of crossing
public roads and places with aerial wires or
fixing supports on other people's property—it
may be necessary to obtain the consent of those
entrusted with the upkeep of the roads and
those owning or otherwise participating in the
ownership of the grounds traversed or used,
the obtaining of the permission is purely a
matter which concerns the licensee.

The installation must be arranged and
constantly maintained in such a way that there
can be no possibility of contact or disturbing
influence on the State telegraph and telephone
wires. Any expense incurred for the obviating
of such disturbances must be borne by the
licensee.

The set may only be used for the reception of
news "For all," intended for general publicity,
and not bulletins addressed to individual
persons, firms or companies (called Cq* bulletins).
These bulletins may only be used for publication

Definite particulars are to be given to the R.T.V. (= State Telegraph Administration) regarding the Cq bulletins* desired by the licensee. They must be entered on a "List of the Cq bulletins* to be received by the wireless receiving station in question," which list is to be attached as an enclosure to the relevant certificate. The licensee is responsible for the correctness of the details. As regards wireless messages entered on the list—provided they are Cq bulletins*—they may be picked up. Applications regarding modifications must be made to the R.T.V.

It is prohibited to pick up any other kind of wireless correspondence. Correspondence overheard at any time in working which is not addressed "To all" may not be written down, divulged, or made use of in any other way.

6. All messages picked up must, without exception, be copied on sheets and bear consecutive numbers. The copies must contain particulars of the wireless receiving station, the transmitting station, the transmitting wave and the receiving time (the date, hour and minute), and must be handed to the R.T.V. (State Telegraph Administration) at the end of each month. Carbon copies of the records may be retained.

7. The wireless receiving installations may only be operated by persons ("Telegraphists") holding a certificate issued by the R.T.V. to the effect that they are capable of operating such kind of sets and are bound to telegraphic secrecy by the R.T.V. The "telegraphists" must be German subjects who are trustworthy, and have not hitherto been punished for breaches against the telegraph laws or the Decree for the protection of wireless communications. They shall be appointed by the Chief Postal Direction at the relevant office for the wireless receiving station, to which office notification must be made of any change of staff with the name of the telegraphist in question.

8. If a telegraphist should, with deliberate intent or through negligence, contravene the provisions under Nos. 5 and 6, the R.T.V. may—irrespective of the penalties resulting therefrom—withdraw the certificate with which the telegraphist had been furnished, and consequently his right to participate in the service of wireless receiving stations in respect of newspapers.

9. The licensee shall have the wireless station supervised for the exact observance of the licence conditions, and to prevent its being used by unauthorised persons. He shall be responsible for the conditions prescribed by the R.T.V. being complied with during working; he shall likewise be personally responsible for the actions and omissions of his employees.

10. Officers of the R.T.V. (= State Telegraph Administration) have right of access at any time to the premises and grounds where the wireless installations or accessories are situated, and may inspect the equipment of the wireless installation and the traffic working.

11. Instructions given by the R.T.V. in special cases to stop working the wireless installations temporarily must be complied with without delay. During this time the working devices of the wireless station are to be sufficiently dismantled as—in the opinion of the R.T.V.—to preclude the possibility of their

being used. The R.T.V. supervises the carrying out of the relevant arrangements.

12. The licensee is responsible for any damage which may be caused to the State or to third parties by the working of the wireless set, in accordance with the legal provisions.

13. The licensee is obliged to pay a quarterly tax of 375 M. to the R.T.V. for each installation. The right is reserved to modify the taxes.

14. In the event of a breach against the foregoing provisions the licence may be withdrawn. This does not affect the licensee's obligation to pay the taxes referred to in No. 13.

15. The right is reserved to modify the foregoing conditions. The licensee is obliged to comply immediately with any alteration in the conditions. All expenses arising from alterations—as regards technical alterations of the wireless devices or in any other respect—have to be borne by the licensee.

Acknowledged:

(Place)....., the..... 192
(Signature).....

CONDITIONS FOR OBTAINING LICENCES FOR SHIPS.

K The following are some of the principal conditions on which the concessions for the installation and working of a radiotelegraph station on board ship is granted:—

1. The concession for the installation and working of the ship station may be withdrawn at any time.

2. The station must fulfil the following requirements:—

(a) The construction of the station must be in accordance with modern developments of science and technology.

(b) The ship station must be equipped in such a way as to be able to use the two wavelengths of 600 and 300 metres.

(c) The waves must be as pure and little damped as possible. The use of sending arrangements with which the production of the emitted waves takes place by direct sparking discharges of the antenna is not permitted, except in cases of distress. However, it may be allowed for certain special stations—e.g., for such on small ships—the primary energy of which does not exceed 50 watts.

(d) The power transmitted by the radiotelegraphic apparatus, measured at the terminals of the generator, must not under normal conditions exceed one kilowatt.

(e) With the reservation of the special provision concerning the application of the 1,800 m. wave, a power of more than one kilowatt may be used if the ship must maintain communication over a distance exceeding 200 nautical miles from the nearest coast station, or if, in consequence of exceptional circumstances, communication cannot be maintained except by means of an increase of power.

(f) The apparatus must be suitable for transmitting and receiving at a speed of at least 20 words per minute, five letters being counted as one word. Installations working with more than 50 watts must be equipped so as to be able to cover several distances within the normal range of transmission, the shortest of which shall be about 15 nautical miles.

(g) The receiving apparatus must be capable of reception up to 600 miles with the greatest possible protection against disturbances.

*Note.—The literal translation of the original German, i.e., "Cq-Nachrichten," is "Cq news" (or Cq correspondence), but having regard to the surrounding context the phrase has been translated as "Cq bulletins."

3. Ships belonging to the first two categories stated under Article 8, in addition to the ordinary apparatus, must be equipped with emergency gear having an independent source of power and capable of working for at least six hours, with a minimum range of 80 nautical miles in the case of ships in the first category, and of 50 nautical miles of those of the second category. The emergency gear is not necessary in the case of ships whose ordinary plant fulfils the conditions for emergency sets.

The emergency gear, as well as the ship stations themselves, must be placed as high as possible above the deck—viz., according to the structure of the ship and the available space, either equal to the height of the bridge or of the large boat deck, so that in case of accident they shall be able to remain longest above the water. When using batteries for the emergency plants accumulators may be arranged in the station room itself, whilst acid accumulators, on account of the vapours which they develop, must be placed outside the station room, but in its immediate vicinity and so that they are protected against outside influences.

4. The contractor must submit to the Imperial Telegraph Administration a description of the ship station, together with a plan of the circuits. Subsequent alterations of the technical equipment affecting transmission or reception must not be made without the consent of the Imperial Telegraph Administration.

5. In order to examine the prescribed arrangement of the ship's station, and the carrying out of the service, the officers of the Imperial Telegraph Administration are permitted at any time to enter the rooms where the apparatus is installed, and to inspect the working equipments.

6. The radiotelegraph service on the ship must be operated only by German subjects.

7. The service of the ship station must be carried out by an operator holding a certificate issued by the Imperial Telegraph Administration, or in an emergency, and for one journey only, by another Government which is a party to the International Radiotelegraphic Convention.

There are two classes of certificates.

The first-class certificate for the capability of the operator, with regard to:—

(a) The adjustment of the apparatus and knowledge of the methods of working.

(b) Transmitting of telegrams and receiving by sound at a speed of at least 20 words per minute.

(c) Knowledge of the regulations applying to the exchange of radiotelegraphic communication.

The second-class certificate may be issued to an operator who attains in transmitting and receiving a speed of 12 to 19 words per minute, but who fulfils the other conditions mentioned above. Operators holding a second-class certificate may be admitted:—

(a) On ships which use radiotelegraphy for their own service only and for the exchange of messages of the crew, in particular on fishing vessels.

(b) On all ships as junior operators, provided that such ships have on board at least one operator holding the first-class certificate. Nevertheless on ships placed in the first category mentioned in Article 8 the service must be carried on by at least two operators holding the first-class certificate.

Transmission may be made only by an operator holding either the first or second class certificate, except in cases of emergency.

8. Ship stations are placed in three categories:

(1) Stations always open.

(2) Stations having limited working hours.

(3) Stations having no fixed working hours.

During navigation the following must remain permanently on the watch:—

(1) The stations of the first category.

(2) Those of the second category during the hours that they are open for service; out of these hours these stations must remain on the watch for the first ten minutes of each hour.

The stations of the third category are not bound to perform any regular "listening" service.

9. The ship station operator is under the supreme authority of the captain or of the captain's representative, who, in his capacity as superintendent of the ship station, is entitled to note the contents of all telegrams provided he has been placed by the Imperial Telegraph Administration, or, in the case of ships that are permanently abroad, by a German Consulate (General or Vice-consulate), under the obligation of preserving the secrecy of correspondence.

10. The certificate may be withdrawn if, in the case of any offences against the "Regulations for the Radiotelegraph Service," the operator has been found guilty after an inquiry.

11. If it is shown that the offence is due to the condition of the apparatus or to instructions given to the operator, the same procedure will be followed in respect of the licence issued to the ship.

12. The certificate may also be withdrawn if it is stated by an officer of the Imperial Telegraph Administration that the operator is no more in possession of the prescribed knowledge and skill. In the latter case a certificate will be granted to the operator after he has successfully passed a further examination.

13. Every change in the staff of the ship station must be reported immediately to the local post office of the home port.

14. The ship station is bound to interchange radiotelegrams with every coast station and with every other ship station, without regard to the particular system of radiotelegraphy employed.

15. The Radiotelegraph Service is regulated in accordance with the rules in the "Instructions for the Radiotelegraph Service." In addition, special instructions which may be issued by the Imperial Telegraph Administration must be observed also.

22. The ship station must be in possession of the certificate from the Imperial Telegraph Administration, stating that the installation and the working of the station have been licensed by the authority named and the category in which the station is placed. This certificate must be kept in the station and presented upon the request of the authorities of the countries at the ports at which the ship calls.

23. If _____ transfers the service of the ship wireless station to a contractor it is incumbent on _____ that the conditions laid down are fulfilled by the contractor.

Place

Date

(Signature)

CONDITIONS FOR THE FITTING AND WORKING OF WIRELESS INSTALLATIONS ON AEROPLANES.

L 1. The licence for the installation and working of the wireless plant on is granted on the understanding that it may be revoked. The transfer of the licence to other parties is prohibited.

2. The plant must, as a rule, only work in connection with the nearest wireless installation intended for the air-service for the exchange of news which concern the working and the safety of aircraft. The transmission of other news is not permitted, whether paid for or gratuitously. In the case of need the aircraft is permitted to get into communication with other wireless stations. In such an event the generalemergency signal must be used.

3. In sending messages only such energy must be used as is absolutely necessary for giving effect to the object in view.

4. The plant must only be worked by the use of a definitely prescribed wave. This wave must be undamped and as sharply tuned as is practicable in the present state of wireless technology. The waves of 300, 450 and 600 metres reserved for purposes of general communication may only be employed in cases of emergency.

5. Transmission limitations and circular working regulations (for example, wave distribution, call signals, apportionment of time, etc.) are given in a separate appendix, and are to be adhered to with exactitude.

6. General public communication as well as the working of the wireless stations of the army and of the navy must not be interfered with.

7. A notice regarding the terms of working of the installed plant is attached to the licence contract, and is to be observed by the owner of the plant. The plant may be only erected and worked in accordance with the terms of this notice. Any departures from the terms of the notice require the consent of the Ministry of Posts and Telegraphs of the State.

8. For purposes of superintendence the official appointed by the Imperial Telegraph Administration is to be permitted to inspect the aircraft at the landing places, and to satisfy himself as to the arrangements made for giving effect to the wireless working.

9. The owner of the plant is unreservedly obliged, under full responsibility, to see that any messages received by the plant from other wireless installations are kept secret under all circumstances, and no use made of them.

10. The owner of the plant is responsible for any damage which may result from the working of the plant in the measure of the legal enactments appertaining to the subject. He is also responsible for the safeguarding of the plant, and for preventing its use by unauthorised persons.

11. Immediate compliance with the demand of the Telegraph Administration of the State, as well as that of its authorised officials, for temporary suspension for working the plant, is stipulated. In this connection the working arrangements (apparatus, antennæ, etc.), or any portion of them, are to be so dealt with during this period that use of the plant is made impossible. The decision in this matter is in the province of the Telegraph Administration of the State.

12. The owner of the plant undertakes to pay an annual fee of m. to the Administration of the Posts and Telegraphs of the State.

13. Amplification or amendment of the conditions set forth above is expressly reserved. The owner of the plant is under obligation to give effect without delay and at his own charges, to any further condition laid down by the Telegraph Administration of the State.

14. The holder of the licence as a guarantee that he will observe the licence conditions, has to deposit an amount of m. with the State Telegraph Administration. This is subject to the assimilation of the amount of guarantee to the monetary value at the time. The service can only be begun after payment of the amount.

At the expiration of the licence the amount deposited, after fulfilment of all the obligations towards the State Telegraph Administration in respect of the erection and working of the installation, will be returned to the holder of the licence.

Accepted
the of 19
Signed

CONDITIONS FOR THE ERECTION AND WORKING OF WIRELESS RECEIVING STATIONS FOR THE RECEPTION OF THE NAUEN TIME SIGNALS.

M 1. The licence for erection and working of the wireless installation is granted on the understanding that it may be revoked. Transfer of the licence to third parties is prohibited.

2. A memorandum of the terms of working of the erected plant is attached to the deed of licence, and must be observed by the owner of the plant. The plant may only be erected and worked in terms of this memorandum. Departures from the terms of the memorandum are subject to the consent of the Secretary of State for Posts and Telegraphs.

3. The plant may only be used for the reception of time signals issued by the Nauen Station operating at present with a wavelength of 3,100 metres. Alteration of this wavelength is reserved.

4. The plant must comply with the following technical requirements:—

(a) The antenna must not be greater, and the connection between the antennæ and the detector circle must not be firmer, than may be necessary for the reception of the signals in view.

(b) The individual parts of the oscillating circuits, as also of the antenna circuit, must always be firmly connected together by means of solder. Exceptions to this rule are only permissible in the case of the switches of the detectors and long distance receivers.

(c) The soldered section must be enclosed within the casing containing all the parts of the apparatus, and is to be closed up by means of lead in such a way that only the switches of the detector and long distance receiver are accessible to the owner of the plant. A wire with a suitable insulating cover is to be used for the antenna conductor external to this enclosed part.

(d) Supplementary insertion of conductors or tuning devices is forbidden.

5. The plant is to be erected and maintained in such a manner that it cannot be prejudicially affected by the State telegraph and telephone lines. Any charges which may be incurred in removing possible causes of disturbance are to be borne by the owner of the plant.

6. The owner of the plant is responsible for any damage which may occur through the working of the wireless installation.

7. The officials of the State Telegraph Department are authorised to visit the premises in which the wireless installations or parts thereof are erected, and to take cognisance of the arrangements which may have been made for carrying out the experiments.

8. The owner of the plant is absolutely obliged under full responsibility to see that under all circumstances messages emanating from other wireless installations and which may be received by him, are kept secret. He is likewise responsible for the safeguarding of the wireless plant and for prevention of its illegal use by unauthorised parties. Failure to do so would involve the withdrawal of the licence.

9. An order from the State Telegraphic Department requiring that the working of the plant shall be temporarily discontinued must be obeyed without delay. During the period of the stoppage of working of the plant, the wireless arrangements or parts thereof must be so dealt with that the use of the installation is rendered impossible. The decision in this connection lies with the State Telegraph Department.

10. The owner of the plant undertakes to pay an annual fee of m. to the State Telegraph Department.

11. Amplification or alteration of the foregoing conditions is reserved. The owner is under obligation to carry out any alteration or extension of the terms of the licence contract without delay at his own cost.

Accepted
the _____ of _____ 1921.
Signed _____

CONDITIONS FOR THE ERECTION AND WORKING OF WIRELESS STATIONS (TRANSMITTING AND RECEIVING STATIONS) FOR OVERLAND POWER STATIONS, WATERWORKS, ETC.

N 1. The licence for the erection and working of wireless installations in
so granted to
in the understanding that it may be revoked.

In the event of the high potential current undertaking or its working passing into other's hands, the transfer of the contract to the legal successor is to be notified without delay to the State Postal Department.

2. The licence deed is an accompanying memorandum approved by the State Postal Department referring to the terms of working of the installed plant, which must be acquiesced in by the owner of the plant under signature.

The installations can only be carried out and worked in terms of this memorandum. Departures from the terms of this memorandum require the consent of the State Postal Department. Any alterations considered later to be necessary in the working instructions set forth in the memorandum in regard to supply of current, the wave to be used, call signals, working periods, etc., are determined by the State Telegraphic Department after consultation with the owner and are to be given effect to.

3. In so far as it may be necessary to obtain the consent of the authorities charged with the upkeep of roads, property owners or other interested parties for stretching over public ways and places antennæ wires and wire conductors for telephonic communication by means of high frequency appliances, or for erecting supports on private property, the obtaining of such consent necessary for the purposes indicated is entirely a matter for the owner of the plant.

4. The range of communication of the different wireless working stations is regulated by the

corresponding memorandum. As regards other wireless stations than those indicated in the memorandum, immediate exchange of messages is not admissible.

Only such news may be transmitted by the wireless plant as refer to the working of the high potential undertaking or the news establishments themselves. The transmission of other news is not allowed either against payment or gratuitously. The reception of news from other wireless stations is forbidden. Wireless communications which may inadvertently be picked up from outside sources must neither be written out, communicated to others, or made use of in any way.

The owner of the plant must have it specially safeguarded in order to ensure its not being used by unauthorised persons.

Every conversation must commence with the indication of the station taking part in such conversation (name and place) when using the telegraphic service with the call signal stipulated by the State Telegraphic Department.

5. When transmitting no more electrical energy must be used than is set forth in the corresponding memorandum. Any departure from the range of wave stated in the memorandum is not permissible. Accordingly the erection of the apparatus used in the wireless plant must be in such correspondence with technical improvements that the use of waves beyond the admissible wave range is impossible, and picking up of wireless communications carried on other waves from other sources is impracticable. Furthermore, suitable means must be employed with the object of preventing high vibration of a character calculated to disturb other wireless communications.

6. The telegraph and telephone traffic (by means of conductors such as wireless) of the State Telegraph Service and other Imperial and State offices, as also private telegraph plants already in operation or invitation of the communication by means of the wireless plant, must not be disturbed by the working of the said wireless plant.

7. The technical arrangements and installations of the wireless plant are to be carried out and constantly maintained in such a manner that the disturbing influence of telegraph and telephone installations of the authorities mentioned under paragraph 6 cannot operate.

Any charges which may arise from rectifying such disturbances are to be borne by the owner of the plant.

8. Any order made in special cases by the State Telegraphic Department for the temporary suspension of the work must be obeyed without delay. During this time the working arrangements of the plant must be so dealt with in accordance with the judgment of the State Telegraphic Department that utilisation of the news plant is excluded. The State Telegraphic Department will supervise the carrying out of the arrangements decided upon.

The order may either be communicated in writing or by telegraph by the Chief Postmaster, or verbally by an official of the State Telegraphic Department provided with the necessary authority.

9. The officials of the State Telegraphic Department who may present themselves in such capacity are invested with the right of access at all times to the rooms or premises in which the wireless installations or parts thereof may be, and to take cognisance of the arrangements appertaining to the wireless plant and of the working of communications.

10. The owner of the plant is responsible, pursuant to legal enactments on the subject,

for any damage which may be sustained by the State Telegraphic Service or third parties through the erection and working of the plants.

11. The owner of the plant undertakes to pay an annual fee ofm. to the State Telegraphic Service for each working station. The fixing of other fees is reserved.

12. Non-compliance with the foregoing conditions may entail the rescission of the licence granted.

13. The amplification or alteration of the foregoing conditions is expressly reserved. In so far as such alterations affect the technical arrangements of the wireless stations or the working of the news plant, a suitable period for the carrying out of these alterations will be fixed as a matter of necessity.

All charges arising from the alteration of

conditions are to be borne by the holder of the plant, whether these are technical alterations in the wireless arrangements or of any other nature.

14. The holder of a licence, as a guarantee that he will observe the licence conditions, has to deposit an amount ofm. with the State Telegraph Administration. This is subject to the assimilation of the amount of guarantee to the monetary value at the time. The service can only be begun after payment of the amount.

At the expiration of the licence the amount deposited, after fulfilment of all the obligations towards the State Telegraph Administration in respect of the erection and working of the installation, will be returned to the holder of the licence.

Accepted.

GIBRALTAR

[See Maps 2 and 10]

THERE are no commercial wireless telegraph stations in Gibraltar, and the right to use wireless telegraphy is reserved to the Government. Private wireless of any description, whether amateur, commercial, or experimental, is strictly forbidden, unless by special licence granted by the Governor, not only the control, but the possession and working of radio-telegraphy, being exclusively vested in military or naval hands.

We print below the ruling Ordinances and Regulations:—

A—Extracts from Ordinance No. 4 of 1885—"The Summary Conviction Ordinance, 1885."

B—Receiving Licences issued under above Ordinance.

C—Rules as to use on Merchant Ships.

D—Ship Licence.

E—Ordinance as to Wireless Telegraphy on Ships.

F—Further Rules as to use on Merchant Ships.

EXTRACT FROM ORDINANCE No. 4 OF 1885.

A (1). This Ordinance may be cited as "The Summary Conviction Ordinance, 1885."

38. No person shall import, keep, use, or establish in Gibraltar or on board any British ship registered in Gibraltar any apparatus or installation for the receipt or transmission of messages by wireless telegraphy without the licence in writing of the Governor, and under such terms and conditions as may be prescribed in such licence, which licence the Governor may in his discretion at any time cancel and revoke.

39. No person shall work any apparatus for wireless telegraphy installed on merchant ships, whether British or foreign, while in Gibraltar, otherwise than in accordance with rules made in that behalf by the Governor, and the Governor may, by any such rules, impose penalties recoverable summarily for the breach of any such rules, not exceeding £10 for each offence, and may provide for the forfeiture on any such breach of apparatus for wireless telegraphy installed or worked on such ships. All such rules shall be published in the *Official Gazette*, and after such publication shall have the same force and effect as if enacted in this Ordinance.

40. It shall be lawful for the Governor by order in writing to authorise the Chief of Police or any other person named by him in such order to enter at any time by day or night, and by force, if necessary, any premises or place or any ship, hulk or other craft in Gibraltar, and to search for any such apparatus or installation or pigeons as described in Sec. 37, 38 or 39 of this Ordinance, and to seize and remove the

same to be dealt with in such manner as the Governor may direct.

41. Any person offending against Sec. 37 or 38 of this Ordinance, or resisting or in any way interfering with any person charged with the execution of an order issued by the Governor under Sec. 40, may be arrested without warrant, and shall be liable to a penalty not exceeding £50, or in the discretion of the magistrate to imprisonment with or without hard labour for any term not exceeding three months.

B Form of Receiving Licence issued under above Ordinance.—

LICENCE TO ESTABLISH WIRELESS TELEGRAPHY RECEIVING SETS.

To all whom these Presents shall come.

THE SCHEDULE.

CONDITIONS.

1. The apparatus installed or set up shall be used solely for the receipt of messages by wireless telegraphy or telephony.

2. The licensee shall not divulge nor allow to be divulged to any person (other than a duly authorised officer of the Government of Gibraltar or a complete legal tribunal) or make any use whatsoever of any message received by means of the apparatus, except messages in connection with the experiments of the licensee received from another experimental station, time signals, musical performances, and messages transmitted by any station for general information.

3. The apparatus shall be fitted with crystal receivers or with valves not capable of oscillation.

4. The combined height and length of the aerial used shall not exceed 100 feet.

5. A fee of 10s. shall be payable to the Colonial Treasurer on the issue of this licence, and a similar fee shall be payable annually on the so long as this licence remains in force.

6. This licence may be cancelled and revoked at any time at the discretion of the Governor.

RULES FOR MERCHANT SHIPS.

C The following rules as to the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in Gibraltar, were made on May 3rd, 1909, under "The Wireless Telegraph Apparatus Further Amendment Ordinance, Gibraltar, 1909":—

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of Gibraltar shall be worked in such a way as not to interfere with (a) Naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in Gibraltar or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of Gibraltar, except with the special or general permission in writing of the Governor.

3. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. Any person offending against any of these rules shall be liable to a penalty not exceeding ten pounds for each offence recoverable summarily under "The Justices Ordinance, Gibraltar, 1890," and any apparatus for wireless telegraphy installed or worked on such ship may be forfeited to His Majesty.

LICENCE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATIONS.

D To all to whom these Presents shall come.

I,....., Governor of the City and Garrison of Gibraltar send greeting:

Whereas Messrs....., of..... (hereinafter call the licensee) is desirous of establishing, installing, working and using, in a ship belonging to the licensee to wit the wireless telegraphy:

And Whereas by reason of the provisions of the Summary Conviction Ordinance, 1885, it is unlawful to establish, keep or use in Gibraltar or on board any British ship registered in Gibraltar any apparatus or installation for the receipt or transmission of messages by wireless telegraphy without the licence in writing of the Governor and under such terms and conditions as may be prescribed in such license.

And Whereas at the request of the licensee have agreed to grant to the licensee the

licences powers and authorities hereinafter expressed and contained for the period and upon the terms and subject to the stipulations and conditions hereinafter appearing:

Now, I, the above-named..... Governor of the City and Garrison of Gibraltar, in exercise of all powers and authorities enabling me in this behalf, do hereby grant to the licensee, during the term or period commencing on the day of the date hereof and until these presents and the licence or permission hereby given shall be determined or revoked, licence and permission.

(i) To establish, install and work for the purposes hereinafter mentioned on board the steamship apparatus for wireless telegraphy (which apparatus is hereinafter referred to as "the licensed apparatus");

(ii) To send and receive messages by means of the licensed apparatus between the said steamship and coast stations and other ship stations.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions:—

1. The provisions of the Imperial Telegraph Acts, 1863 to 1916, and the Regulations made thereunder shall be deemed to apply to this licence and on any breach thereof this licence shall be null and void.

2. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912, the Service Regulations made thereunder and any modification of the Convention or Regulations made from time to time.

3. The licensee shall, except as set out hereinafter, use the licensed apparatus solely on behalf and in the course of the business of the licensee and the licensee shall not receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

4. The licensee shall so far as possible receive from ships and lights stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

Given under my hand and seal at Gibraltar this.....day of.....19..

AN ORDINANCE TO MAKE PROVISION WITH RESPECT TO WIRELESS TELEGRAPHY ON SHIPS.

NOVEMBER 8TH, 1920.

E Be it enacted by His Excellency the Governor of the City and Garrison of Gibraltar, as follows:—

1. (1) Every se going British ship registered in Gibraltar being a passenger steamer or a ship of sixteen hundred tons gross or upwards shall be provided with a wireless telegraph installation, and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this Ordinance, and shall be provided with one or more certified operators and watchers, at least, in accordance with those rules:

Provided that the Governor may exempt from the obligations imposed by this Ordinance any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

(2) The Governor shall make rules prescribing

the nature of the wireless telegraph installation to be provided, of the services to be maintained, and the number, grade, and qualifications of operators and watchers to be carried:

Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Imperial Merchant Shipping (Convention) Act, 1914.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but, if the offence is prosecuted summarily, the fine shall not exceed one hundred pounds.

(4) The Governor shall appoint a surveyor of ships or a wireless telegraphy inspector, who may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Ordinance and for the purpose of that inspection such surveyor or inspector shall have all the powers of a Board of Trade inspector under the Imperial Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the Governor to the Treasurer and Collector at Gibraltar, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Ordinance.

(5) The obligations imposed by this Ordinance shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by the Imperial Wireless Telegraphy Act, 1904, or any Order-in-Council, or regulations made thereunder, or by the Imperial Merchant Shipping (Convention) Act, 1914.

2. The foregoing provisions of this Ordinance shall, as from a date three months after the coming into operation of the obligations imposed by this Ordinance on British ships registered in Gibraltar, apply to ships other than British ships registered in Gibraltar while they are within the port of Gibraltar in like manner as they apply to British ships so registered.

3. (1) This Ordinance may be cited as the Merchant Shipping (Wireless Telegraphy) Ordinance, 1920, and shall come into operation on the first day of December, 1920.

(2) This Ordinance shall be construed as one with the Merchant Shipping Ordinance,

1886, and "passenger steamer" shall mean a steamer which carries more than twelve passengers.

Passed, 8th November, 1920.

By Command,

Colonial Secretary.

F RULES MADE BY THE GOVERNOR UNDER THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ORDINANCE 1920.

These rules are identical with the Merchant Shipping (Wireless Telegraphy) Rules, dated July 10th, 1920, in force in Great Britain (see page 224), except that clauses 10 to 12 read as follows:

QUALIFICATIONS OF OPERATORS.

10. (1) Operators shall be graded into three grades in accordance with Rules to be made by the Governor and watchers shall be certificated by the Postmaster-General of the United Kingdom hereinafter called the Imperial Postmaster-General.

(2) Until graded in accordance with such Rules as aforesaid:—

(i) An operator who holds the Imperial Postmaster-General's First Class Certificate of Proficiency and who has had three years' experience as an operator may be employed as if he held a First Grade Certificate, but if an operator holding a First Grade Certificate is available an operator holding a First Class Certificate shall not be so employed on a ship of Class I which is required by these rules to carry three operators.

(ii) An operator who holds the Imperial Postmaster-General's First or Second Class Certificate of Proficiency and who has had one year's experience as an operator may be employed as if he held a Second Grade Certificate.

(iii) An operator who holds the Imperial Postmaster-General's First or Second Class Certificate of Proficiency and who has had less than one year's experience as an operator may be employed as if he held a Third Grade Certificate.

11. The Governor may accept in lieu of the certificate of the Imperial Postmaster-General certificates granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force.

12. These Rules shall come into operation on the 1st day of December, 1920.

Given under my hand and seal, at Gibraltar this day of

By Command,

Colonial Secretary

GOLD COAST

(See Maps 24 and 26.)

THE Gold Coast Colony is administered by a Governor with an Executive and a Legislative Council.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Major S. B. Gosling	Postmaster-General	Accra.
Mr. D. B. Evans	Engineer-in-Chief of Posts and Telegraphs Dept.	Do.

ORGANISATION.

Radiotelegraphy was introduced in 1912, and in 1913 the Accra station was completed.

A Government experimental station has also been in operation from time to time in Accra, and a few licences for experimental receiving stations have been issued to amateurs. Radiotelegraphy and telephony is still in its infancy in this Colony, and no decisive results have yet been gained from the experimental stations.

ADMINISTRATION.

The first Act to regulate radiotelegraphy in this Colony was "The Wireless Telegraphy Ordinance, 1903." This was followed by "The Wireless Telegraphy (Amendment) Ordinance, 1913." These Ordinances, however, were both of them repealed by "The Wireless Telegraphy Ordinance No. 15 of 1913."

Annexed to this Ordinance are regulations applying to Merchant Ships, and Rules for the Regulation of Wireless Telegraphy within territorial waters. The Laws and Regulations here printed are :—

A—Wireless Telegraphy Ordinance No. 15 of 1913 (dated October 4th, 1913).

B—Regulations (Merchant Ships).

A AN ORDINANCE (NO. 15) to provide for the regulation of Wireless Telegraphy, 4th October, 1913.

Be it enacted by the Governor of the Gold Coast Colony, with the advice and consent of the Legislative Council thereof, as follows :—

1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraphy without the aid of any wire connecting the points from and at which the messages or other communications are sent or received; Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

(2). In this Ordinance "Wireless Telegraphy" and its cognate terms include, except where the context otherwise requires, a reference to all forms of radiotelegraphy and radiotelephony. Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmissions of messages.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the Colonial waters otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His

Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the Colonial waters shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate or District Commissioner is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any licence granted under this Ordinance, he may grant a search warrant to any Commissioner or Assistant Commissioner of Police or any person appointed in that behalf by the Commissioner of Police and named in the warrant, and a warrant so granted shall authorise the Commissioner or Assistant Commissioner of Police or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before a District Commissioner's Court on the complaint of a Commissioner or Assistant Commissioner of Police or of any person thereto authorised by the Commissioner of Police in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphy Ordinance, 1903, and the Wireless Telegraphy (Amendment) Ordinance, 1913, are hereby repealed.

REGULATIONS.

B (i) All apparatus for wireless telegraphy on board a merchant ship in the Colonial waters shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the Colonial waters and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(ii) In these regulations "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

(iii) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour, port or bay of the Colony except with the special or general permission of the Governor.

(iv) For the purpose of any proceedings under these regulations the master or person being, or appearing to be, in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(v) Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed, with the person being or appearing to be, in command or charge of the ship.

(vi) These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

GREAT BRITAIN.

(See Maps 2, 4 and 5).

Including : Northern Ireland, The Isle of Man and the Channel Islands.

CONTROL.

THE Postmaster-General is responsible for the administration of wireless telegraphy in Great Britain.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Rt. Hon. Sir W. Mitchell-Thompson, Bart.	Postmaster-General	General Post Office, London, E.C.
Sir George Evelyn P. Murray, K.C.B.	Secretary to Post Office	Ditto.
Mr. F. J. Brown, C.B., C.B.E., M.A., B.Sc.	Assistant Secretary to Post Office	Ditto.

DEPARTMENT OF THE INSPECTOR OF WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Comdr. F. G. Loring, R.N., M.I.E.E.	Inspector of Wireless Telegraphy	General Post Office, London, E.C.
Lt.-Col. C. G. G. Crawley, R.M.A., M.I.E.E.	Deputy Inspector of Wireless Telegraphy.	Ditto.
Mr. F. Addey, B.Sc. (Lond.), M.I.E.E., Fellow I.R.E.	Assistant Inspector of Wireless Telegraphy.	Ditto.
Mr. S. E. J. Burrow	Ditto	Ditto.
Lt.-Comdr. E. L. C. Grattan, D.S.O., R.N.	Ditto	Ditto.
Capt. A. H. Read, M. Eng.	Ditto	Ditto.

ORGANISATION.

The Merchant Shipping (Wireless Telegraphy) Act, 1919—came into operation on September 1st, 1920. We print the Act and rules hereunder.

Licences for reception are now obtainable at any Head Post Office.

ADMINISTRATION.

The following is a list of the principal Laws and Regulations at present in force in Great Britain :—

A—Wireless Telegraphy Act, 1904.

- B**—Order in Council, February 29th, 1908.
- C**—Wireless Telegraphy (Foreign Ships) Regulations, 1908.
- D**—Ship Stations Licence.
- E**—Board of Trade Notice (Signalling Practice).
- F**—Merchant Shipping (Convention) Act, 1914. (Part III.)
- G**—Extracts from *London Gazette*, April 29th, 1919.
- H**—Merchant Shipping (Wireless Telegraphy) Act, 1919.
- I**—Rules made under Merchant Shipping (Wireless Telegraphy) Act.
- J**—Extract from Convention relating to International Air Navigation, 1919.
- K**—Form of Licence for Wireless on Aircraft.
- L**—Admiralty Notice to Mariners No. 524 of March 25th, 1920.
- M**—Postmaster-General's authority for the use of Transmitting and Receiving Apparatus for Amateurs.
- N**—G.P.O. Notice. New Form of Broadcast Receiving Licence.
- O**—Experimental Transmitting Licence, Provisional Authorisation and Conditions.
- P**—Receiving Licence.

WIRELESS TELEGRAPHY ACT, 1904.

A Following the termination of the meeting of the delegates at the International Conference in Berlin in 1903, the British Government drafted a Wireless Telegraph Act to define the official position of the Postal and Telegraph Department in the United Kingdom in regard to the new development. The Act received Royal assent on August 15th, 1904, and the text is as follows:—

1. (1) A person shall not establish any wireless telegraph station, or install or work any apparatus for wireless telegraphy, in any place or on board any British ship except under and in accordance with a licence granted in that behalf by the Postmaster-General.

(2) Every such licence shall be in such form and for such period as the Postmaster-General may determine, and shall contain the terms, conditions and restrictions on and subject to which the licence is granted, and any such licence may include two or more stations, places, or ships.

(3) If any person establishes a wireless telegraph station without a licence in that behalf, or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be guilty of a misdemeanour, and be liable, on conviction under the Summary Jurisdiction Acts, to a penalty not exceeding ten pounds, and on conviction on indictment to a fine not exceeding one hundred pounds, or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Act except by order of the Postmaster-General, the Admiralty, the Army Council, or the Board of Trade.

(4) If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within his jurisdiction without a licence in that behalf, he may grant a search warrant

to any police officer or any officer appointed in that behalf by the Postmaster-General, the Admiralty, the Army Council, or the Board of Trade, and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) Sections 684, 685, and 686, of the Merchant-Shipping Act, 1894, (which relate to the jurisdiction of courts and justices), and section 693 of the same Act (which relates to distress for sums ordered to be paid by masters and owners of ships), shall apply to the jurisdiction of courts and justices in respect of ships, and to distress under this Act.

(6) The Postmaster-General may make regulations for prescribing the form and manner in which applications for licences under this Act are to be made, and, with the consent of the Treasury, the fees payable on the grant of any such licence.

(7) The expression "wireless telegraphy" means any system of communication by telegraph as defined in the Telegraph Acts 1863 to 1904, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received; Provided that nothing in this Act shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. (1) Where the applicant for a licence proves to the satisfaction of the Postmaster-General that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted, subject to such special terms, conditions, and restrictions as the Postmaster-General may think proper, but shall not be subject to any rent or royalty.

(2) Where an applicant for a licence satisfies the Postmaster-General that a wireless telegraph station is to be used solely for the transmission of telegrams which are within the first or second exception from the exclusive privilege of transmitting telegrams conferred upon the Postmaster-General by the Tele-

graph Act, 1869, a licence for that purpose, if granted, shall not be subject to any rent or royalty.

(3) It shall be lawful for the Postmaster-General, due regard being had to the maintenance and exercise of effective control over wireless telegraphy, to grant special licences at reduced terms for the establishment and working of wireless telegraph stations to be used exclusively for the transmission within the United Kingdom of news to public registered newspapers. A schedule of all reduced rents or royalties imposed by any special licences shall be laid before both Houses of Parliament within fourteen days of the commencement of the session next succeeding the grant of any such licences.

3. (1) This Act may be cited as the Wireless Telegraphy Act, 1904, and may be cited with the Telegraph Acts, 1863 to 1904.

(2) This Act shall extend to the whole of the British Islands and to all British ships in the territorial waters abutting on the coast of the British Islands, and the Royal Courts of the Channel Islands shall register this Act accordingly.

(3) His Majesty in Council may order that this Act shall, subject to any conditions, exceptions, and qualifications contained in the order, apply during the continuance of the order to British ships whilst on the high seas.

(4) A person shall not work any apparatus for wireless telegraphy installed on a foreign ship whilst that ship is in territorial waters otherwise than in accordance with regulations made in that behalf by the Postmaster-General, and the Postmaster-General may, by any such regulations, impose penalties recoverable summarily for the breach of any such regulations not exceeding ten pounds for each offence and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ship. Save as aforesaid, nothing in this Act shall apply to the working of apparatus for wireless telegraphy installed on any foreign ship.

4. In the application of this Act to Scotland the expression "Misdemeanour" means crime and offence.

5. In the application of this Act to the Channel Islands and the Isle of Man:—

(1) The Lieutenant-Governor of the Island of Jersey or the Island of Guernsey, and the Governor, Lieutenant-Governor, or Deputy-Governor of the Isle of Man, as the case may require, shall be substituted for the Board of Trade.

(2) Offences may be prosecuted, fines recovered, proceedings taken, and search warrants issued in such courts and in such manner as may for the time being be provided in the Channel Islands and the Isle of Man by law, or, if no express provision is made then in and before the courts and in the manner in which the like offences, fines, proceedings, and warrants may be prosecuted, recovered, taken, or issued therein by law, or as near thereto as circumstances admit, and the bailiff or his lieutenant, or any jurat of the Royal Court in the Island of Jersey or the Island of Guernsey, and the judge or any jurat of the Court of Alderney, and the high bailiff or two justices of the peace in the Isle of Man shall, respectively be substituted for a justice of the peace.

6. This Act shall continue in force until the thirty-first day of July, nineteen hundred and

six, and no longer unless Parliament otherwise determines. (It was renewed until December 31st, 1909, and has since been extended from year to year by the Expiring Laws Continuance Act.)*

The following Order in Council is dated February 29th, 1908:—

(1) The Wireless Telegraphy Act, 1904, shall apply to British ships whilst on the high seas, provided that a person on board a British ship which is registered in any British possession (other than the Channel Islands and the Isle of Man), or in any British Protectorate, shall not be deemed to commit an offence against the Wireless Telegraphy Act, 1904, by reason of the installation or working of wireless telegraphy on such ship if the authority in such Possession or Protectorate having power by law so to do, shall have granted a licence for the installation and working of apparatus for wireless telegraphy on that ship, and if such person is acting in accordance with the provisions of such licence.

(2) The Interpretation Act, 1889, shall apply for the purpose of the interpretation of this Order as it applies for the purpose of the interpretation of an Act of Parliament.

(3) This Order shall be published in the *London Gazette*, and shall come into operation immediately from and after the expiration of three months after this Order is so published.

(4) This Order may be cited as "The Wireless Telegraphy Order, 1908."

An Order was issued in 1908 (No. 496) containing regulations relating to foreign ships:—

1. In these Regulations unless the context otherwise requires—

"Wireless Telegraphy" has the same meaning as in the Wireless Telegraphy Act, 1904.

"Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

"Territorial Waters" means such part of the sea adjacent to the coast of the British Islands as is deemed by international law to be within the territorial sovereignty of His Majesty, and includes harbours.

"Harbour" includes harbours properly so called, whether natural or artificial, estuaries, navigable rivers, piers, jetties, and other works in or at which ships can obtain shelter, or ship and unship goods or passengers.

When communications are made by means of wireless telegraphy between a foreign ship in territorial waters and a wireless telegraph station in the British Isles, the rules in force for the working of wireless telegraphy at that station shall be observed.

3. All apparatus for wireless telegraphy on board a foreign ship in territorial waters shall be worked in such a way as not to interrupt or interfere with—

(a) Naval Signalling, or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the British Islands or the territorial waters abutting on the coast of the British Islands, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph

*The text of the Bill amending this Act is printed at the end of the Laws and Regulations Section.

stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. (1) Except with the special permission in writing of the Postmaster-General no apparatus for wireless telegraphy on board a foreign ship (other than a ship of war) shall be worked or used whilst such ship is in harbour in the British Islands.

(2) Without prejudice to the operation of the general provisions of these Regulations, the use of wireless telegraphy on board a foreign ship of war while in a harbour in the British Islands shall be subject to such rules (whether prohibitive or regulative) as may be made by the Admiralty from time to time.

5. (1) If at any time in the opinion of one of His Majesty's Principal Secretaries of State an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, and notice to that effect is published by the Postmaster-General, after the publication of such notice and until further notice the use of wireless telegraphy on board foreign ships whilst in territorial waters shall be subject to such rules as may be made by the Admiralty from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

(2) Such notice as aforesaid shall be published in the *London Gazette*, the *Edinburgh Gazette*, and the *Dublin Gazette*, and in such other manner, if any, as to the Postmaster-General may seem fit.

6. (1) Any person who shall offend against any provision of these Regulations or of any Rules made by the Admiralty thereunder shall be liable on conviction under the Summary Jurisdiction Acts for every such offence to a penalty not exceeding ten pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy installed or worked on board the ship on which the offence was committed shall be seized and forfeited.

(2) For the purposes of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any foreign ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(3) Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

7. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

8. These Regulations shall come into operation on the first day of July, 1908.

9. These Regulations may be cited as "The Wireless Telegraphy (Foreign ships) Regulations, 1908."

The following is a copy of the form of Licence granted by the Postmaster-General to establish Wireless Telegraph

Ship Stations:—
LICENCE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATIONS.

To all to whom these presents shall come

I, The Right Honourable

His Majesty's Postmaster-General send greeting;

Whereas by reason of the provisions of the Telegraph Acts 1863 to 1909 and the Wireless

Telegraphy Order 1908 it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any British ship (whether in the territorial waters of the British Islands or on the high seas) except under and in accordance with a licence granted in that behalf by the Postmaster-General:

And whereas — (hereinafter called the licensee) has applied to the Postmaster-General for the grant of a licence to establish install and work apparatus for wireless telegraphy as defined in Section 1 (7) of the Wireless Telegraphy Act 1904 at the ship station or stations mentioned in the Schedule hereto.

Now I the above-named — His Majesty's Postmaster-General in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the 31st day of December next and thereafter so long as the Wireless Telegraphy Act 1904 shall remain in force unless and until these presents and the licence and permission hereby given shall be determined licence and permission—

(i) To establish install and work for the purposes hereinafter mentioned at the ship station or stations specified in the Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedule hereto (which apparatus is hereinafter referred to as "the licensed apparatus"):

Proved that—

(a) Each ship station shall comply in all respects with the provisions of any Rules from time to time made by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act 1919;

(b) The apparatus installed at each ship station shall be of the character specified in the said Schedule opposite to the name of such station;

(c) The sending apparatus used at each ship station shall be of such a character that the waves emitted are as pure and as little damped as possible and the receiving apparatus used at the said station or stations shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals;

(d) The licensed apparatus shall be so constructed as to be capable of using wavelengths of 600 and 300 metres in length as measured by the standard of measurement in use by the Post Office for the time being. The licensed apparatus may be so constructed as to use any of the wavelengths specified in columns 5 and 6 of the Schedule hereto or any wavelengths prescribed by any administration for communication with direction finding stations and such other wavelengths as may be authorised in writing from time to time by the Postmaster-General. Provided always that the wavelength of 600 metres shall normally be used for communication and further that the wavelength of 1,800 metres may be used for transmission in the exceptional case contemplated by Article XXXV (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention 1912:

Provided further that only the wavelength of 600 metres (except as directed by the Admiralty) shall be used by the licensee during the period of any war in which the United Kingdom is engaged;

(e) The apparatus shall admit of the transmission and reception of messages at

the rate of not less than 20 words a minute five letters being counted as one word;

(ii) To send and receive messages by means of the licensed apparatus between the said ship stations and also between the said ship stations and coast stations and other ship stations; Provided that the licensee shall not except with the consent in writing of the Postmaster-General at any time send spoken messages from the said ship stations or send or receive messages from and at the said ship stations when in any harbour in the British Islands; and

(iii) To receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said licence and permission, is granted on and subject to the following conditions and provisions:

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "the Postmaster-General" means the Postmaster-General for the time being.

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904.

The term "telegraph" has the same meaning as in the Telegraph Act 1869.

The expression "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether a coast station or a ship station.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

The expression "the International Telegraph Convention" and "the International Telegraph Regulations" means respectively the International Convention of St. Petersburg dated the 10th/22nd July 1875 and the Service Regulations made thereunder and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraph Convention 1912" means the Convention signed at London on the 5th day of July 1912 and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the despatch or receipt of messages except messages authorised by this licence.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the

licensed apparatus interfere with Naval signalling.

(2) If the Admiralty are of opinion that the working of the licensed apparatus at any ship station specified in the Schedule hereto is inconsistent with the free use of Naval signalling the licensee shall when required in writing by the Postmaster-General so to do close the said station.

(3) These provisions for the protection of Naval signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Telegraph Acts 1863 to 1920 by the Postmaster-General with the consent of the Treasury in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraph Convention 1921.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Postmaster-General from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not without the consent of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

9. The licensee shall keep the licensed apparatus and in particular the headgear receivers thereof in a clean and sanitary condition.

10. The licensee shall screen all lights emanating from the licensed apparatus in such manner as may be necessary to ensure the reasonable comfort and health of operators and watchers.

11. The licensee shall at all times indemnify the Postmaster-General against all actions claims and demands which may be brought or made by any corporation company or person in respect of any injury arising from any act licensed or permitted by these presents.

12. (1) Subject to the provisions of this licence the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge order of transmissions or otherwise. Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government or the Government of any British Possession or Protectorate the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

13. The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the

proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

14. The licensed apparatus at each of the ship stations mentioned in the Schedule hereto shall be worked only by operators holding certificates issued by the Postmaster-General and the licensee shall provide for the working of each station such certified operators and watchers as are required by the provisions of any Rules from time to time made by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act, 1919.

15. The licensee shall not divulge to any

person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the ship stations specified in the Schedule hereto a copy of Section 11 of the Post Office (Protection) Act 1884 and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of this licence entitling the Postmaster-General under Clause 24 hereof to revoke and determine this licence.

1 Name of Ship on which Station established.	2 Call- Signal.	3 Normal Range of Signal- ling in Nautical Miles.	Character of Apparatus.		Power		9 If Alt. r- nator is used Number of Cycle per Second
			4 System of Radiotele- graphy with the Charac- teristics of the System of Emission.	Wavelengths (in Metres).	7 Source.	8 Maximum to be taken by Sending Instru- ments	
				5 Spark or Inter- rupted Con- tinuous Wave.	6 Con- tinuous Wave.		
						Ship's mains.	

16. The licensee shall keep full accounts records and registers of all messages transmitted by means of the licensed apparatus and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination and such further particulars as the Postmaster-General shall from time to time reasonably require to be shown messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for a period of at least fifteen months counting from the month following that in which the radiotelegrams were handed in as prescribed by the Radiotelegraph Convention 1912 and such registers and message papers shall be open to the inspection of the Postmaster-General or his officers thereto authorised at the registered office of the licensee for the time being or at such other place as may be agreed between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a statute or general holiday.

17. The licensee shall render to the Postmaster-General such accounts as the Postmaster-General shall direct in respect of all charges due or payable under the Radiotelegraph Convention 1912 in respect of messages exchanged between the ship stations hereby licensed and coast stations and shall pay to the Postmaster-General at such times and in such manner as the Postmaster-General shall direct all sums which shall be due from the licensee under such accounts.

18. The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the ship stations hereby licensed for the purpose of inspecting and may inspect any

apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instruments respectively.

19. The licensee shall carry on every ship on which a ship station is established under this licence a print or copy of the licence certified under the hand of an appropriate officer of the Postmaster-General to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls. The licensee shall also carry on every such ship such documents as may be prescribed by the Postmaster-General for the purpose of enabling the licensee to communicate with coast stations and ship stations in accordance with the Radiotelegraph Convention 1912.

20. The licensee shall forthwith pay to the Postmaster-General for and in respect of the licence hereby granted a sum of ————* in respect of each ship station at which the licensed apparatus is installed and in addition thereto a sum of two pounds in respect of each such ship station on the first day of January in each year during which the licence remains valid.

21. Except with the consent in writing of the Postmaster-General the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licences, powers or authorities hereby granted or any of such licences powers or authorities.

*The fee payable for the first year will be £2, 30s., £1 or 10s. according to whether the licence is issued in the first, second, third or fourth quarter of the year.

22. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval Military Customs or Police Officer or any other person authorised by the Admiralty to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to use the same for His Majesty's service and in that event any such officer or person so authorised may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent the use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised as aforesaid may in any such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may enter upon any ship on which any apparatus is installed accordingly or the said officer or person so authorised as aforesaid may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised as aforesaid may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

23. At any time after the 31st day of December 1912 the Postmaster-General may in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Postmaster-General under any condition or provision herein contained.

24. In any of the following cases (that is to say) :—

(a) In case any sum of money which ought to be paid by the licensee to the Postmaster-General under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained

then and in any such case the Postmaster-General may by notice in writing under his seal revoke and determine these presents and the licences powers and authorities hereinbefore granted and each and every of them as to all or any of the ship stations hereby licensed and

thereupon these presents and the said licences powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said ship stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

25. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Postmaster-General from time to time to enter into agreements for or to grant licences relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the United Kingdom by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Telegraph Acts or any of them.

26. Any notice request or consent (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of any officer of the Post Office duly authorised by him and may be served by sending the same in a registered letter addressed to the licensee at the registered office for the time being of the licensee or if such notice request or consent relates to any particular ship station by delivery to the master of the ship upon which such station is installed and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office London.

Lastly any licence or permit heretofore granted by the Postmaster-General to the licensee in respect of any of the ships specified in the Schedule hereto is hereby revoked.

As witness my hand and seal this
day of one thousand nine hundred
and

Signed sealed and delivered by

On behalf of the Postmaster-General in the
presence of

E In October, 1912, the Board of Trade, at the request of the Lords Commissioners of the Admiralty, issued a notice directing the attention of Masters and Owners of British Merchant Vessels to the necessity for arranging for periodical practices in Wireless Telegraphy communications between H.M. Ships of War and Ships of the British Mercantile Marine for the purpose of ensuring efficient and reliable communication when required.

The co-operation is invited of all British shipowners and masters whose ships are fitted with wireless telegraphy, in order to give effect to the following proposals :—

(1) At 8.30 a.m. and 2.30 p.m. daily any single man-of-war (destroyers and small craft excluded) or one man-of-war in a fleet in company, detailed by the Senior Naval Officer present, will adjust her wireless telegraphy

transmitting and receiving apparatus to the commercial 600 metre wavelength and make the call "CCCC," followed by her own commercial call sign, indicating that she is prepared to carry out an exercise with any British merchant ship within range.

On a British merchant ship receiving this call she will answer and say whether or not she is prepared to proceed with the exercise. Should more than one merchant ship answer, the man-of-war will indicate which is to exercise and which is to wait.

The exercise will then proceed, but no messages are to be exchanged which are not authorised by the respective captains and masters of the ships practising. No message received during such exercises is to be forwarded beyond the ship actually receiving the message and no payment for any message can be made. The exercises are to be considered as strictly on Service and not for any commercial advantage.

(2) In all such exercises the man-of-war is to be considered the controlling ship.

(3) The exercises will cease at 9.15 a.m. and 3.15 p.m. respectively, or before, at the discretion of the captains concerned.

(4) These exercises are only to be carried out between vessels neither of which is within 150 miles range of any commercial shore station using the 600 metre wavelength, and are to cease at once should one of H.M. ships so direct.

MERCHANT SHIPPING (CONVENTION) ACT, 1914.

F An Act to make amendments of the law relating to Merchant Shipping as are necessary or expedient to give effect to an International Convention for the Safety of Life at Sea, signed in London on January the twentieth, nineteen hundred and fourteen, and for purposes incidental thereto. (August 10th, 1914.)

PART III.

(Which deals with Wireless Telegraphy.)

15. (1) Subject to the provisions of this Act every British ship registered in the United Kingdom which carries 50 or more persons shall be provided with a wireless telegraphy installation, and shall maintain a wireless telegraphy service which shall be at least sufficient to comply with the rules made for the purpose under this Act, and shall be provided with certified operators and watchers at least in accordance with those rules. Provided that the obligations imposed by this section shall not come into operation until such date, not being less than six months after the making of those rules, as may be specified in the rules.

(2) In reckoning the number of persons carried on a ship for the purpose of this section, persons shall not be counted who are exceptionally and temporarily carried on a ship—

(a) As the result of *force majeure*; or

(b) As the result of the necessity of increasing the number of the crew to fill the places of members of the crew who are ill or disabled; or

(c) As the result of the obligation on the part of the master to carry shipwrecked

persons, or persons in like circumstances; or,

(d) If so provided by rules of the Board of Trade, as cargo hands for a part of the voyage not being between one continent and another and not being, during the time the hands are carried, outside the limits of latitude thirty degrees north and thirty degrees south.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but if the offence is prosecuted summarily the fine shall not exceed one hundred pounds.

16. (1) The Board of Trade, in consultation with the Postmaster-General, shall make such rules with respect to wireless telegraphy installations and service on British ships which are registered in the United Kingdom and with respect to the carrying on those ships of operators and watchers for the purposes of wireless telegraphy, as appear to them necessary or expedient to carry into effect the provisions of the Convention mentioned in Part V of the Third Schedule to this Act.

(2) The Board of Trade may by rules made under this section exempt from the obligations of this Act as to wireless telegraphy—

(a) Ships while on voyages the course of which does not take the ship more than a hundred and fifty sea miles from the nearest coast, if the Board are satisfied that the route and the conditions of the voyage are such as to render compliance with those obligations unreasonable or unnecessary; and,

(b) Sailing ships on which owing to the peculiar or primitive nature of their build, it is impossible to provide a proper wireless telegraphy installation.

(3) The Board of Trade may by rules made under this section provide that any automatic calling apparatus which is certified by them to be efficient and to have been accepted by the parties to the Convention may be substituted, for the purposes of the provisions of this Act, and any rules made thereunder relating to wireless telegraphy, for a certified operator or watcher.

17. The Board of Trade may postpone the operation of the provisions of this Act relating to wireless telegraphy as respects any particular ship for such period as the Board of Trade determine in each case, if it is shown by the owners of the ship that they have taken all reasonable steps to comply with the provisions of this Act as respects the ships, but that they have been unable to do so owing to difficulties in obtaining delivery of any wireless telegraphy apparatus or of obtaining the service of certificated operators or watchers.

The period of postponement under this section shall not exceed one year in the case of ships which are required in pursuance of the Convention to provide a first-class wireless telegraphy service, and two years in the case of ships which are so required to provide a third-class wireless telegraphy service, and in the case of ships which are so required to provide a second-class wireless telegraphy service shall not exceed one year as respects the provision of a wireless telegraphy installation and two years as respects the provision of a continuous watch.

THE SCHEDULE.

Name of Station.	Normal Range of Signalling.		Character of Apparatus.		Power.		If Alternator is used, No. of Cycles per Second.
	By Night.	By Day.	Description of Receiving Apparatus.	Wave-lengths (in Metres).	Source and Maximum Output.	Maximum to be taken by Transmitting Instruments.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

G EXTRACTS FROM SUPPLEMENT TO THE LONDON GAZETTE OF TUESDAY, THE 29TH OF APRIL, 1919.

Wednesday, 30th April, 1919.
Air Ministry.

AIR NAVIGATION REGULATIONS, 1919.
ORDER OF THE SECRETARY OF STATE UNDER THE AIR NAVIGATION ACTS, 1911 TO 1919.

In pursuance of the powers conferred upon me by the Air Navigation Acts, 1911 to 1919, and all other powers enabling me in that behalf, I, the Right Honourable Winston Spencer Churchill, one of His Majesty's Principal Secretaries of State, by order make the following regulations:—

GENERAL CONDITIONS OF FLYING.

1. No aircraft shall fly within the limits of the British Islands and the territorial waters adjacent thereto unless the following conditions are complied with:—

(6) No mails shall be carried without the consent in writing of the Postmaster-General and no wireless apparatus shall be installed or worked except under and in accordance with a licence granted by the Postmaster-General, containing such conditions as may be approved by the Secretary of State:

PRODUCTION OF LICENCES, CERTIFICATES AND LOG-BOOKS FOR INSPECTION.

6. (1) Any member of the personnel of an aircraft shall on demand produce his licence for the inspection of any person authorised for the purpose by the Secretary of State.

(2) The owner and person in charge of any aircraft shall, on demand, produce for the inspection of any person authorised for the purpose by the Secretary of State, any certificates or licences relating to the aircraft, and also, in the case of passenger or goods aircraft, any of the prescribed log-books.

EXCEPTIONS.

8. These regulations do not, except where otherwise expressly stated, apply—

(a) To military aircraft belonging to or employed in the service of His Majesty; or

(b) To any aircraft or to any persons if and to such extent as such aircraft or persons may be excepted from these regulations, or any of them, by direction of the Secretary of State on the recommendation of a Government Department.

PENALTIES.

10. (1) Where any aircraft flies in contravention of, or fails to comply with, these regu-

lations or any provision thereof, the owner of the aircraft, and also the pilot or commander, shall be deemed to have contravened, or, as the case may be, failed to comply with these regulations:

Provided that it shall be a good defence to any proceedings for contravention or failure to comply with these regulations if the contravention or failure is proved to have been due to stress of weather or other unavoidable cause.

(2) If any person obstructs or impedes any person acting under the authority of the Secretary of State in the exercise of his powers and duties under these regulations, such first-mentioned person shall be deemed to have acted in contravention of these regulations.

(3) Any person contravening or failing to comply with these regulations or any provision thereof is liable to imprisonment for a term not exceeding six months or to a fine not exceeding two hundred pounds, or to both such imprisonment and fine.

(5) If any person in any aircraft is guilty of any act of espionage to which the provisions of section one of the Official Secrets Act, 1911, apply, he is liable to penal servitude for a term not exceeding seven years.

INTERPRETATION.

12. In these regulations, unless the context otherwise requires—

"Aircraft" includes airships and flying machines, all balloons, whether fixed or free, and kites;

"Military aircraft" includes naval, military, and air-force aircraft;

"Personnel" (in relation to any aircraft) includes any pilot, commander, navigator, and engineer, and any operative member of the crew;

The Interpretation Act, 1889, applies for the purpose of the interpretation of these regulations as it applies for the purpose of the interpretation of an Act of Parliament, and as if these regulations were an Act of Parliament.

SHORT TITLE.

14. These regulations may be cited as the Air Navigation Regulations, 1919.

WINSTON S. CHURCHILL,
One of His Majesty's Principal Secretaries of State.

Air Ministry, London,
30th April, 1919.

H MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ACT, 1919. CHAPTER 38.

AN ACT TO MAKE FURTHER PROVISION WITH RESPECT TO WIRELESS TELEGRAPHY ON SHIPS.

August, 15th 1919.

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. (1) Every sea-going British ship registered in the United Kingdom being a passenger steamer or a ship of sixteen hundred tons gross tonnage or upwards shall be provided with a wireless telegraph installation, and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this Act, and shall be provided with one or more, certified operators and watchers, at least, in accordance with those rules:

Provided that the Board of Trade may exempt from the obligations imposed by this Act any ships or classes of ships if they are of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

(2) The Board of Trade, in consultation with the Postmaster-General, shall make rules prescribing the nature of the wireless telegraph installation to be provided, of the services to be maintained, and the number, grade, and qualifications of operators and watchers to be carried:

Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but if the offence is prosecuted summarily, the fine shall not exceed one hundred pounds.

(4) A surveyor of ships or a wireless telegraphy inspector may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Act, and for the purpose of that inspection shall have all the powers of a Board of Trade inspector under the Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the Board of Trade to the chief officer of customs of any port at which the ship may seek to obtain a clearance or transire, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Act.

(5) The obligations imposed by this Act shall not come into operation while the obligations with respect to wireless telegraphy on ships imposed by the Defence of the Realm Regula-

tions remain in force, but shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by the Wireless Telegraphy Act, 1904, or any Order in Council, or regulations made thereunder, or by the Merchant Shipping (Convention) Act, 1914.

2. The foregoing provisions of this Act shall, as from a date three months after the coming into operation of the obligations imposed by this Act on British ships registered in the United Kingdom, apply to ships other than British ships registered in the United Kingdom while they are within any port in the United Kingdom in like manner as they apply to British ships so registered.

3 (1) This Act may be cited as the Merchant Shipping (Wireless Telegraphy) Act, 1919, and the Merchant Shipping Acts, 1894 to 1916, and this Act may be cited together as the Merchant Shipping Acts, 1894 to 1919.

(2) This Act shall be construed as one with the Merchant Shipping Act, 1894, and "passenger steamer" shall mean a steamer which carries more than twelve passengers, and "wireless telegraphy inspector" means an officer appointed under section twenty of the Merchant Shipping (Convention) Act, 1914, for the purposes therein mentioned.

I THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) RULES, 1920, DATED JULY 10TH, 1920, MADE BY THE BOARD OF TRADE UNDER THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ACT, 1919 (9 & 10 GEO. 5, C. 38):

The Board of Trade hereby make the following rules under the provisions of the Merchant Shipping (Wireless Telegraphy) Act, 1919.

Dated this tenth day of July, 1920.

H. A. PAYNE,

Secretary to the Board of Trade.

INTERPRETATION.

1. In these Rules—

The expression "coasting trade" means trade exclusively carried on between ports in the British Islands.

The number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

CLASSIFICATION OF SHIPS.

2. For the purposes of these Rules ships shall be classified as follows:—

Class I—Ships carrying 200 persons or more which are not engaged in the coasting trade.

Class II—Ships not engaged in the coasting trade carrying 50 but less than 200 persons and ships engaged in the coasting trade carrying 50 persons or more.

Class III—Ships carrying less than 50 persons.

In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

NATURE OF INSTALLATION.

3. The installation shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention of Safety of Life at Sea, 1914), or of any international agreement by which the said Convention of 1921 may be superseded.

4. The installation shall be of the spark or interrupted continuous wave type.

5. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this rule as to emergency installations as well as those as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 nautical miles by day under normal condition and circumstances.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for Ships of Classes II and III, and such independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this rule an installation shall be deemed to comply with the above requirements as to range if it is able to maintain communication on a 600 metre wave at a range of one-and-a-half times the number of nautical miles hereinbefore respectively prescribed over sea by day with a Post Office Standard Station when employing a receiver without amplification devices.

6. There shall be provided between the bridge and the wireless telegraph room means of communication by voice pipe, telephone or other means and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

SHIPS NOT FITTED WITH APPROVED AUTOMATIC APPARATUS.

7. If not fitted with an approved automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall be always on watch :—

NUMBER AND GRADE OF OPERATORS.

- | NATURE OF VOYAGE. | OPERATORS. |
|--|---|
| (a) Voyage exceeding 48 hours from port to port. | Three operators, of whom one shall hold a First Grade Certificate, and not more than one a Third Grade Certificate. |
| (b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. | Two operators of whom one shall hold a First or a Second Grade certificate. |
| (c) Voyage not exceeding 8 hours from port to port. | One operator who shall hold a First or a Second Grade certificate. |

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table and while at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Rules, and either a certificated operator or a certificated watcher shall always be on watch at other times.

NUMBER AND GRADE OF OPERATORS AND WATCHERS.

- | | |
|--|--|
| (a) Voyage exceeding 48 hours from port to port. | One operator who shall hold a First or a Second Grade certificate, and two watchers. |
|--|--|

- | | |
|--|---|
| (b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. | One operator who shall hold a First or a Second Grade certificate, and one watcher. |
| (c) Voyage not exceeding 8 hours from port to port. | One operator who shall hold a First or a Second Grade certificate. |

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall always be on watch at the times specified in the Schedule to these Rules.

SHIPS FITTED WITH APPROVED AUTOMATIC APPARATUS.

8. In the event of an automatic apparatus for registering the signal of distress being approved by the Board of Trade and the Postmaster-General a ship of Class III shall be fitted with such apparatus unless the duration of the voyage on which it is employed does not exceed eight hours from port to port, but in such a case the operator shall be on watch during the whole time of the voyage.

9. If fitted with automatic apparatus for registering the signal of distress approved as aforesaid :—

(i) A ship of Class I shall carry certificated operators in accordance with the following table and while at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by a certificated operator, or by a watcher, or by means of the approved automatic apparatus :—

NUMBER AND GRADE OF OPERATORS.

- | NATURE OF VOYAGE. | OPERATORS. |
|--|--|
| (a) Voyage exceeding 48 hours from port to port. | Two operators, one of whom shall hold a First Grade certificate. |
| (b) Voyage not exceeding 48 hours from port to port. | One operator who shall hold a First or a Second Grade certificate. |

(ii) A ship of Class II shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, both of which have been approved by the Board of Trade and the Postmaster-General, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Rules.

QUALIFICATIONS OF OPERATORS.

10. (1) Operators shall be graded into three grades in accordance with Rules to be made by the Postmaster-General with the concurrence of the Board or Trade and watchers shall be certificated by the Postmaster-General.

(2) Until graded in accordance with such Rules as aforesaid :—

Schedule A.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

Zones.	Western Limit.	Eastern Limit.	Times of Watch for One Operator, Greenwich Mean Time.	Times of Watch for Two Operators, Greenwich Mean Time.
A. Eastern Atlantic, Mediterranean, North Sea, Baltic, Western Arctic Sea.	Meridian of 30° W., Coast of Greenland.	Meridian of 30° E. to the South of the Coast of Africa. Eastern limit of Mediterranean, Black Sea, and of the Baltic, 30° E. to the North of Coast of Norway.	from 8 h. to 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.
B. Indian Ocean, Eastern Arctic Sea.	Eastern Limit of Zone A	Meridian of 90° East	from 4 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 18 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 24 h.
C. China Sea, Western Pacific Ocean	Eastern Limit of Zone B.	Meridian of 160° E.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 12 h. „ 14 h.	from 0 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 22 h.
D. Central Pacific Ocean.	Eastern Limit of Zone C.	Meridian of 140° W.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 24 h.
E. Eastern Pacific Ocean.	Eastern Limit of Zone D.	Meridian of 70° W. South of the Coast of America, West Coast of America.	from 0 h. to 2 h. 4 h. „ 6 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 14 h. 16 h. „ 22 h.
F. Western Atlantic Ocean and Gulf of Mexico.	Meridian of 70° W. South of the Coast of America, East Coast of America.	Meridian of 30° W., Coast of Greenland.	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 22 h.

(i) An operator who holds the Postmaster-General's First Class certificate of Proficiency and who has had three years experience as an operator may be employed as if he held a First Grade certificate, but if an operator holding a First Grade certificate is available an operator holding a First Class certificate shall not be so employed on a ship of Class I which is required by these Rules to carry three operators.

(ii) An operator who holds the Postmaster-General's First or Second Class certificate of Proficiency and who has had one year's experience as an operator may be employed as if he held a Second Grade certificate.

(iii) An operator who holds the Postmaster-General's First or Second Class certificate of Proficiency and who has had less than one year's experience as an operator may be employed as if he held a Third Grade certificate.

11. The Postmaster-General may accept certificates granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force.

12. These Rules shall come into operation on the 1st day of September, 1920.

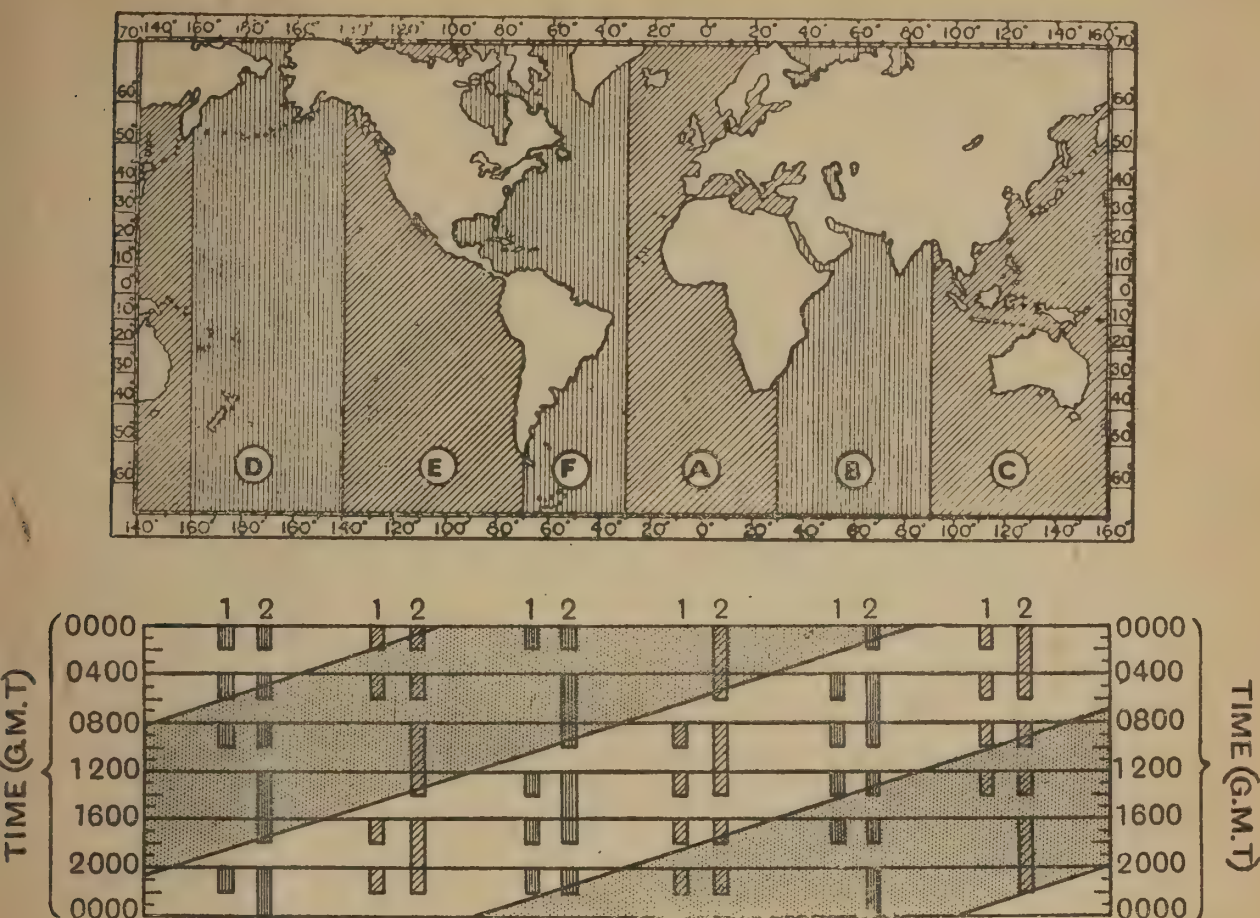
EXTRACT FROM BOARD OF TRADE NOTICES TO MARINERS.

BRITISH SHIPS FITTED WITH C.W. APPARATUS.—A wave of 2,400 metres has been adopted for British ships as the long C.W. listening wave.

In general this wave shall be used for C.W. communication between mobile stations.

During their schedule hours of service ship stations equipped for long C.W. working shall listen on the wave of 2,400 metres for 10 minutes between 35 minutes and 45 minutes past each hour G.M.T. During this period (e.g., 0235 to 0245, etc.), stations which have messages for ship stations will call up these ship stations on 2,400 metres and arrange time and, if necessary, wavelength upon which communication shall take place. The wave of 2,400 metres is not to be used for any other purpose during these periods, with the exception of distress messages. (January, 1925).

SCOTLAND, W. COAST.—River Clyde. Use of W/T Apparatus in the River Clyde.—In order to enable ships to avoid meeting each other at bends and other unsuitable places while navigating the River Clyde, authority has been given for large ships in charge of pilots to use their wireless apparatus between Glasgow and Gourock, subject to the following conditions:



(1) Messages must be exchanged on a wavelength of 800 metres by means of the ship's emergency apparatus and transmitted direct to the ship of destination. (2) The use of the apparatus must be restricted to occasions of real urgency. (3) Messages must be confined to stating the position of the transmitting ship; asking for the position of the receiving ship, and, if desired, asking or giving the weather conditions. (4) No message giving instructions regarding the navigation of any other ship may be sent. (5) The pilot is responsible for seeing that the messages are in conformity with the conditions. (January, 1925).

J EXTRACT FROM CONVENTION RELATING TO INTERNATIONAL AIR NAVIGATION (1919):—

ART. 14.—No wireless apparatus shall be carried without a special licence issued by the State whose nationality the aircraft possesses. Such apparatus shall not be used except by members of the crew provided with a special licence for the purpose.

Every aircraft used in public transport and capable of carrying ten or more persons shall be equipped with sending and receiving wireless apparatus when the methods of employing such apparatus shall have been determined by the International Commission for Air Navigation.

This Commission may later extend the obligation of carrying wireless apparatus to all other classes of aircraft in the conditions and according to the methods which it may determine.

K LICENCE TO ESTABLISH WIRELESS TELEGRAPH AIRCRAFT STATIONS.

To all to whom these presents shall concern I, the Right Honourable

His Majesty's Postmaster-General send greeting :

Whereas by reason of the provisions of the Telegraph Acts 1863 to 1920 it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the United Kingdom or in any British aircraft except under and in accordance with a licence granted in that behalf by the Postmaster-General :

And whereas

(hereinafter called "the licensee") has applied to the Postmaster-General for the grant of a licence to establish install and work apparatus for wireless telegraphy as defined in Section I (7) of the Wireless Telegraphy Act 1904 at the aircraft station or stations mentioned in the First Schedule hereto :

Now I the above-named

His Majesty's Postmaster-General in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the thirty-first day of December one thousand nine hundred and unless and until these presents and the licence or permission hereby given shall be determined as hereinafter provided licence and permission—

I. To establish install and work for the purposes hereinafter mentioned at the aircraft station or stations specified in the First Schedule hereto apparatus for wireless telegraphy of the

kind specified in the Schedules hereto (which apparatus is hereinafter referred to as "the licensed apparatus");

II. To send and receive messages by means of the licensed apparatus for the purposes and subject in all respects to the conditions and restrictions contained in the Second Schedule hereto.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the Schedules hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "the Postmaster-General" means the Postmaster-General for the time being.

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904.

The term "telegraph" has the same meaning as in the Telegraph Act 1869.

The expression "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships or aircraft of His Majesty's Navy between ships or aircraft of His Majesty's Navy and Naval stations or between a ship or aircraft of His Majesty's Navy or a Naval station and any other wireless telegraph station.

The expression "Government aircraft signalling" means signalling by means of any system of wireless telegraphy between two or more Government aircraft between any Government aircraft and any wireless station or between any Government aerodrome and any other wireless station.

The expressions "the International Telegraph Convention" and the "International Telegraph Regulations" mean respectively the International Convention of St. Petersburg dated the 10th/22nd July 1875 and the Service Regulations made thereunder and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraph Convention 1912" means the Convention signed at London on the 5th day of July 1912 and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The term "aircraft" includes all balloons, whether fixed or free, airships and flying machines.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the despatch or receipt of messages except messages authorised by this licence.

3.—(1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling or Government aircraft signalling.

(2) Whenever the operators at any signal station of the licensees perceive through the medium of the instruments used by them that Naval signalling or Government aircraft signalling is proceeding they shall refrain from using the licensed apparatus until all indication that Naval signalling or Government aircraft signalling is proceeding shall have ceased.

(3) These provisions for the protection of Naval signalling or Government aircraft signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Telegraph Acts 1863 to 1920 by the Postmaster-General with the consent of the Treasury in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraph Convention 1912 so far as they are not inconsistent with the other provisions of this licence the expressions "ship" and "ship station" in the Convention being read as if "aircraft" and "aircraft station" respectively were substituted therefor.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Postmaster-General from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensee shall comply in all respects with all such directions and regulations as may from time to time be given or made by the Secretary of State for Air.

9. The licensed apparatus shall not without the consent of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the Schedules hereto.

10. The licensee shall at all times indemnify the Postmaster-General against all actions claims and demands which may be brought or made by any Corporation Company or person in respect of any injury arising from any act licensed or permitted by these presents.

11. The licensee shall so far as possible receive from aircraft ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

12.—(1) The licensed apparatus at each of the aircraft stations mentioned in the First Schedule hereto shall be worked only by operators holding Air Operators' certificates issued by the Postmaster-General and such operators shall only work the apparatus in accordance with the tenor of the certificate which they hold and subject in all respects to the conditions of this licence.

(2) Air Operators' Certificates will be of two classes. A First Class Certificate authorising the holder to work wireless apparatus on aircraft for the sending or receiving of messages in general and a Second Class Certificate authorising the holder to work wireless apparatus on aircraft for the purpose of sending and receiving spoken messages only. Such certificates will be granted to approved natural-born British subjects of such technical proficiency and will be in such form and will be subject to such conditions as the Postmaster-General shall from time to time prescribe and they may be endorsed

or withdrawn at the discretion of the Postmaster-General in accordance with the conditions to which the certificates respectively are subject.

13. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the stations specified in the Schedule hereto a copy of Section 11 of the Post Office (Protection) Act 1884 and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of this licence.

14. The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the aircraft stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instruments respectively.

15. The licensee shall carry on every aircraft on which an aircraft station is established under this licence a print or copy of the licence certified under the hand of an appropriate officer of the Postmaster-General to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the aircraft calls.

16. The licensee shall forthwith pay to the Postmaster-General for and in respect of the licence hereby granted a royalty of per annum in respect of each aircraft station at which the licensed apparatus is installed.

17. Except with the consent in writing of the Postmaster-General the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licences powers or authorities hereby granted or any of such licences powers or authorities.

18.—(1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval Military Air or Police Officer or any other person authorised by the Secretary of State for Air to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to use the same for His Majesty's service and in that event any such officer or person so authorised may enter upon any aircraft on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised as aforesaid may in any such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct,

and such persons may enter upon any aircraft on which any apparatus is installed accordingly or the said officer or person so authorised as aforesaid may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised as aforesaid may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

19. The Postmaster-General may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Postmaster-General under any condition or provision herein contained.

20. In the case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions or conditions herein contained then and in any such case the Postmaster-General may by notice in writing under his seal revoke and determine these presents and the licences powers and authorities hereinbefore granted and each and every of them as to all or any of the aircraft stations hereby licensed and thereupon these presents and the said licences powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said aircraft stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

21. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish extend, maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Postmaster-General from time to time to enter into agreements for or to grant licences relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the United Kingdom by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit, And (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Telegraph Acts or any of them.

22. Any notice request or consent (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of any officer of the Post Office duly authorised by him and may be served by sending the same in a registered letter

8. The licensed apparatus shall not be used except during actual flight or in case of forced landing.

9. The licensed apparatus may be used for receiving messages on any subject, but shall be used only for sending messages on the following subjects:—

- (a) Distress signals;
- (b) Meteorological information;
- (c) Forced landings and landing instructions;
- (d) Positions;
- (e) Supply of fuel and spare parts;
- (f) Origin, destination, or course of flight.

10. Except with the written permission of the Postmaster-General, the Aircraft Normal Wave and no other wave shall be used for the sending and receipt of messages to and from—

- (a) Other aircraft stations;
- (b) Ground stations specified by the Secretary of State for Air.

11. Except with the written permission of the Postmaster-General, the Aircraft Ship Wave and no other wave shall be used for the sending and receipt—

- (a) Of messages to and from ships of His Majesty's fleet and merchant ships;
- (b) Of such messages as are rendered necessary by reason of exceptional emergency and not coming within the scope of the above-mentioned provisions for the use of the Aircraft Normal Wave.

12. The procedure employed for the sending and receipt of messages to and from each aircraft station and other aircraft stations shall conform to instructions laid down by the Secretary of State for Air.

Signed sealed and delivered by
in the presence of

On behalf of the Postmaster-General.

L WIRELESS DIRECTION FINDING STATIONS.

USE BY THE MERCANTILE MARINER.
ADMIRALTY NOTICE TO MARINERS, No. 524 OF
25TH MARCH, 1920.

The following is promulgated for information:—

The Admiralty have recently received evidence from various sources that the existence of Wireless Direction Finding Stations in the United Kingdom, France, Canada, the United States and Germany, and the regulations under which these stations are operated, are not as generally known throughout the Mercantile Marine as is desirable in view of the immense value of the system of wireless direction finding as an aid to navigation, especially in thick and foggy weather.

2. On the other hand, returns rendered by the stations in the United Kingdom show that where the system is known to masters it is beginning to be more extensively used, not only when atmospheric conditions render it impossible to obtain the ship's position by any other means, but as a check on positions obtained by the ordinary method of navigation.

3. Information on this subject was first published in Admiralty Notice to Mariners No. 1,019 of May 23rd, 1919. This Notice has since been revised, and the latest information on the subject is contained in Admiralty Notice to Mariners No. 363 of the year 1920 (reproduced in Board of Trade Notice to Mariners). This Notice should be studied by masters who desire to make use of this system; the procedure to be adopted, which varies to some extent for the different stations and as to the wavelength to be used, is set out therein in detail. It is equally

necessary that W/T operators should study the procedure.

4. Briefly put, a ship requiring a bearing calls up the D.F. station or stations from which it is desired to receive a bearing, singly or together, according to the procedure laid down. The station or stations reply with the bearing (true) of the ship from that station.

5. The following stations are established in the United Kingdom: Berwick, Flamborough, Lizard, Carnsore.

6. These stations are operated by the Royal Navy, but are available for the use of the Mercantile Marine.

7. A charge of five shillings (5s.) will be made as from April 1st, 1920, for each bearing asked for and given. Thus, if bearings from two stations or two separate bearings from one station were asked for, the charge would be ten shillings (10s.).

8. Charges will be collected by the Accountant-General of the Navy from the Administration controlling and operating the ships concerned, in accordance with the present system of collecting charges for W/T commercial messages.

9. The accuracy with which bearings can be taken depends on certain conditions outlined in the Notice to Mariners referred to, but, although the bearings given by a station within the section over which it is designed to work can generally be considered accurate to within two degrees, it must be distinctly understood that the Admiralty provide this service on the express condition that they incur no liability for any consequences resulting directly or indirectly from any inaccuracy in the bearings given from any failure in the service, or from any other cause whatever.

(Notice No. 524 of 1920, dated March 25th.)

Authority.—The Lords Commissioners of the Admiralty. (H. 2049/20.)

EXPERIMENTS IN WIRELESS TELEGRAPHY.

M. N.B.—Under the Wireless Telegraphy Act, 1904, the Postmaster-General's authority is necessary before any apparatus for wireless telegraphy is installed or worked.

AUTHORITY FOR SENDING AND RECEIVING.

Summary of Conditions of Issue.

NOTE.—All sending stations must also be equipped for reception.

1. The applicant shall produce evidence of British nationality and two written references as to character. A certificate of birth should be furnished if possible, but this will not be insisted on if the referees testify of their own knowledge that the applicant is of British nationality. The referees should be persons of British birth and of standing, not related to the applicant.

In the case of a company, society or other body, application should be made by one of the principals on behalf of the company, etc. Any permit granted will be issued in his name, and he will be personally responsible for the observance of its terms.

2. The installation shall be subject to the approval of the Postmaster-General, and shall be open to inspection at all reasonable times by properly authorised officers of the Post Office, who will produce their cards of identity on request.

3. Secrecy of correspondence shall be observed.

4. Applicants must satisfy the Postmaster-General that they have in view some definite

object of scientific value or general public utility. If scientific research is intended they should be certified as competent investigators by a Government department or some recognised scientific body.

5. Each sending station must be under the charge of a person who has satisfied the Postmaster-General, by examination or otherwise, that he has attained :—

(a) Sufficient knowledge of the adjustment and operation of the apparatus which he wishes to work.

(b) An operating speed of at least 12 words (Morse) a minute, sending and receiving. This qualification is necessary even when wireless telephony only is used in order that the person in charge of the station may be in a position to act upon instructions in the Morse code issued by Government and commercial stations.

A fee of 5s. will be charged for the examination referred to above when necessary.

The person in charge of a sending station must also make himself acquainted with the regulations of the International Convention in so far as they relate to the prevention of interference and impose certain duties on all wireless operators. This information is contained in Section V of the Postmaster-General's Handbook for Wireless Operators, which may be obtained through any bookseller, or direct from the Stationery Office, price 1s. 3d., postage 3d.

A licensee not possessing the necessary operating qualifications may be allowed, exceptionally, to employ a qualified operator to work the sending apparatus.

6. Small fees are payable in order to cover the Post Office expenses in connection with the grant of a permit and subsequent inspection, etc., of the station. For each station authorised to use power up to 10 watts the charges, which will cover the use of receiving as well as sending apparatus, will comprise an initial licensing fee of 10s. plus an annual fee of £1, payable in advance (*i.e.* 30s. for the first year and £1 for each succeeding year). Higher fees will be charged for more powerful stations.

7. *Aerials*.—Dimensions allowed are as follows:—Combined height and length not to exceed 100 feet.

8. *Portable Stations* (*i.e.*, field stations).—General conditions same as for fixed stations.

Power of portable sending stations will usually be limited to 10 watts.

Use will ordinarily be authorised only within a radius of 10 miles of a fixed point.

The applicant for authority to use wireless sending and receiving apparatus should complete the form of application forwarded herewith and return it to the Secretary, General Post Office, London, E.C.1, together with the required evidence of British nationality, etc.

The fee should not be forwarded until formal application is made for it.

NOTICE REGARDING NEW FORM OF BROADCAST RECEIVING LICENCES.

N PRESS NOTICE—BROADCAST LICENCES—
P.N. 291.

The Postmaster-General announces that important alterations will be made on July 1st in the arrangements for the issue of wireless receiving licences.

Under the scheme adopted in October last, two types of licences are at present issued to persons other than experimenters, *viz.* :—

Broadcast Licence—Fee 10s.—Covering the use of apparatus bearing the registered trade mark of the British Broadcasting Company.

Constructor's Licence—Fee 15s.—Covering the use of apparatus made or put together by the licensee, subject to his undertaking not knowingly to use, in constructing his set, parts manufactured elsewhere than in Great Britain or Northern Ireland.

The agreement between the Post Office and the British Broadcasting Company provides that, after the end of 1924, the Postmaster-General may, if he sees fit, discontinue the issue of the present types of licences and issue one type only at 10s., free of any conditions as to the marking or country of origin of the apparatus. The Company have, however, agreed to the introduction, on July 1st, of a new form of licence at 10s., which will cover any type of receiving set, whether purchased complete or constructed from parts, on the understanding that the existing restrictions against the use of foreign apparatus which, under the Post Office agreement with the Company, are to continue until December 31st, will not be removed before that date.

The new type of receiving licence at 10s. will be issued to all persons who hold the present 10s. and 15s. licences (whether broadcast or constructor's licences or the "interim" licences issued during October last) as they fall due for renewal, and also to applicants for new licences after June 30th.

The reduction of the fee from 15s. to 10s. involves a reduction in the portion payable to the British Broadcasting Company from 12s. 6d. to 7s. 6d.; and the Postmaster-General has expressed to the Company his appreciation of their action in agreeing to this reduction six months in advance of the date specified in the agreement.

General Post Office.

June 20th, 1924.

FORM OF EXPERIMENTAL TRANSMITTING LICENCE.

O General Post Office,
London, E.C.1,

.....192..

EXPERIMENTS IN WIRELESS TELEGRAPHY.

SIR,—With reference to your letter of the and previous correspondence, I am directed by the Postmaster-General to say that, pending the issue of a formal licence, he authorises you to establish a wireless telegraph sending and receiving station for experimental purposes at subject to the conditions overleaf.

This permit is subject to withdrawal or modification at any time, either by specific notice in writing sent to you by post at the address shown above, or by means of a general notice in the *London Gazette* addressed to all holders of licences for experimental wireless telegraph transmitting stations.

Failure to transmit the call signal or to tune accurately to an authorised wavelength, the use of unauthorised power or waves or any other breach of the conditions, will render it necessary for this permit to be cancelled, and in event of cancellation no part of the fee will be returned.

This permit replaces that of the and you will no doubt be so good as to return the Post Office letter of that date for cancellation.

I am, Sir, etc.

K.604.

Recd. 5465/24.

CONDITIONS.

1. The sending apparatus used at the station shall be of the description specified in the licensee's application, and the combined height and length of the aerial shall not exceed 100 feet. An aerial which crosses above or is liable to fall upon or be blown on to any overhead power

wire (including electric lighting and tramway wires) must be guarded to the reasonable satisfaction of the owner of the power wire concerned.

2. The power used for transmission shall not exceed 10 (ten) watts, as defined in the Licensee's application, and messages shall be sent only on waves from 150 to 200 metres inclusive (*tonic train, c.w. and telephony*) and a further fixed wave of 440 metres (*c.w. and telephony only*). Spark transmission is specifically forbidden.*

3. The station shall always be equipped for reception as well as transmission and the sending apparatus shall invariably be tuned accurately within the authorised limits.

4. Messages may be sent at any time, but the time occupied in transmission shall not exceed two hours during any consecutive period of twenty-four hours. The use of the wavelength of 440 metres is not allowed between 5 p.m. and 11 p.m. on weekdays and when the British Broadcasting Company's programmes are being transmitted on Sundays.

5. A record shall be kept of all transmissions, showing the date and times of each transmission and the wavelength and system (*tonic train, c.w. or telephony*) employed.*

6. No transmission shall commence without listening-in on the wavelength which is to be used, in order to ascertain whether the proposed transmission is likely to interfere with any other station which may be working. No single transmission shall last more than ten consecutive minutes and each transmission shall be followed by a period of not less than three minutes listening-in on the wavelengths used for transmission. Listening-in must in all cases be performed by.....Transmission shall at once be discontinued or postponed at the request of any Government or Commercial stations.

7. Messages shall be transmitted only to stations in Great Britain or Northern Ireland which are actually co-operating in the licensee's experiments and shall relate solely to such experiments. The use of the apparatus for general calls or the transmission of news advertisements or similar matter is expressly forbidden.

8. The call signal.....has been allotted to the station. In calling up another transmitting station the call sign of that station should be sent three times, the word "from" once, and the call signal of the calling station three times. In answering a call, the call signal of the calling station should be sent three times, the word "from" once and the call signal of the station once. The call signal of the station transmitting should also be sent three times at the beginning and end of each subsequent period of transmission, and on every occasion when the wavelength is changed.

Call signals are not allotted to stations for receiving only.

9. The station shall be subject to the approval of the Postmaster-General and together with the record of transmission, shall be open to inspection at all reasonable times by duly authorised officers of the Post Office, who will produce their cards of identity on request.

10. The station shall be used in such a manner as to cause no interference with other stations. In particular, reaction must not be used for reception to such an extent as to energise any neighbouring aerial.

11. The Licensee shall not divulge or allow to be divulged to any person (other than a duly authorised officer of His Majesty's Government or a competent legal tribunal) or make any use whatsoever of any message received

* The words in italics are subject to alteration to meet special cases.

by means of his apparatus, except messages in connection with his experiments received from another experimental station.

NOTE.—Licences for PORTABLE TRANSMITTING STATIONS are issued on the same basis.

Special permission may be obtained in certain cases for the use of power in excess of 10 watts or for COMMUNICATION WITH FOREIGN STATIONS.

Licences are also issued for the use of Transmitting Apparatus with an ARTIFICIAL AERIAL ONLY, upon the following conditions:

An artificial aerial is defined as a closed, non-earthed, oscillatory circuit possessing inductance, capacity and resistance, and functioning in place of the usual aerial-earth system. It must be as nearly non-radiating as possible. The inductance should be in one piece and of small dimensions (as distinct from an inductance of large dimensions such as a frame aerial), the maximum area formed by the turns of the inductance not exceeding 3 (three) square feet.

The artificial aerial circuit must be so arranged as to reduce radiation to a point at which signals from it will not be perceptible outside the building in which the apparatus is installed, and no attempt shall be made to send signals to other stations. It is intended that the effects produced by the sending apparatus shall be ascertained by means of suitable detecting or measuring devices coupled with or used within a few feet of the inductance of the "artificial" aerial.

The power input to the sending apparatus must not exceed 10 watts.

The allotted call sign should be sent three times before and after each experiment or short series of experiments, and on every occasion when the wavelength is changed. The station must be open to inspection at all reasonable times by duly authorised officers of the Post Office.

This form of licence is only granted in respect of addresses where authority is also held to use receiving apparatus.

Licences for PORTABLE RECEIVING STATIONS are issued only to holders of licences for fixed stations, and are granted on the same basis as for fixed stations. They are generally limited to an area of 10 miles radius from the fixed station, or, alternatively, from some fixed point authorised under the terms of the licence.

RECEIVING LICENCE.

WIRELESS TELEGRAPHY ACT, 1904.

P Mr.....
(Name in full)
of.....is hereby
(Address in full)

authorised (subject in all respects to the conditions set forth on the back hereof) to establish a wireless station for the purpose of receiving messages at.....

(Address of station)
for a period ending on the last day of the month of.....192 . The payment
(Date of expiration)
of the fee of ten shillings is hereby acknowledged.
.....192

Issued on behalf of the
Postmaster-General

.....
for Postmaster.
Signature of Licensee

.....
If it is desired to
continue to maintain
the station after the

Stamp of Issuing
Officer.

date of expiration a fresh licence must be taken out within fourteen days. Heavy penalties are prescribed by the Wireless Telegraphy Act, 1904, on conviction of the offence of establishing a wireless station without the Postmaster-General's Licence.

CONDITIONS.

1. The licensee shall not allow the station to be used for any purpose other than that of receiving messages in the premises occupied by the Licensee.

2. The station shall not be used in such a manner as to cause interference with the working of other stations. In particular, reaction must not be used to such an extent as to energeise any neighbouring aerial. (*See Note*).

3. The combined height and length of the external aerial (where one is employed) shall not exceed 100 feet. An aerial which crosses above or is liable to fall upon or to be blown on to any overhead power wire (including electric lighting and tramway wires) must be guarded to the reasonable satisfaction of the owner of the power wire concerned.

4. The licensee shall not divulge or allow to be divulged to any person (other than a duly authorised officer of His Majesty's Government or a competent legal tribunal) or make any use whatsoever of any message received by means of the station other than time signals, musical performances and messages sent for general reception, and messages received from a licensed

experimental station in connexion with experiments carried out by the licensee.

5. The station and this licence shall be open to inspection at all reasonable times by duly authorised officers of the Post Office, who will produce their cards of identity on request.

6. This Licence may be cancelled by the Postmaster-General at any time either by specific notice in writing sent by post to the licensee at the address shown hereon, or by means of a general notice in the *London Gazette* addressed to all holders of wireless receiving licences for broadcast messages, and will be cancelled on breach of any of the foregoing conditions. In the event of cancellation no part of the fee will be returned.

NOTE.

Interference is taking place if a continuous "note" or "whistle" is heard. If this "note" or "whistle" changes when the wavelength of the receiver is altered the cause of interference is the receiver and reaction must be reduced until no "note" or "whistle" is audible. If the "note" or "whistle" does not change the interference is due to some external source.

Any permanent change of address must be promptly communicated to the Head Postmaster of the district in which the station is situated. Notice of a temporary change is not required.

NOTE.—On payment of an additional fee a separate portable licence may be obtained by the holder of a licence for a fixed station.

GREECE.

(See Maps 3 and 14)

GREECE comprises the southern part of the Balkan Peninsula, including Western Thrace, Macedonia, Epirus and Islands in the Ægean, Mediterranean and Ionian Seas, including Crete. It is now a Republic with Admiral Coundouriotis as temporary President.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
M. G. Roussos ..	Minister of the Navy ..	Ministry of the Navy.
Com. R.N. Gr. Mezöviris,	Head of the Radiotelegraphic Service ..	24 Ithakis Street, Athens
* Radio Engineer.		
Com. S. Kastalis ..	First Assistant to Head of Radio Service	19 Sonierou St., Athens

CONTROL AND ORGANISATION.

The following is a summary of the wireless stations under the control of the Greek Naval Authorities.

Land Stations under the Ministry of the Navy	..	12
Receiving Station under the Ministry of the Navy	..	1
Private Receiving Stations	.. .. .	12
Private Land Station	.. .. .	1
Ship Stations for Public Service	.. .. .	208
Stations on Warships	.. .. .	63
Government Land Stations for Public Service	.. .. .	6

The new station in Canea has been completed, and is opened to the public service. Also five others of the existing coast stations are open for public service.

During the present year the main 60 kW. station of Athens will be opened to the public service.

A new C.W. transmitter is now installed in the old Athens station. The installation of C.W. is also proposed in some others of the existing coast stations during the present year.

Meteorological signals and press bulletins are transmitted by the main Athens station.

Time signals, meteorological and press, are also transmitted by the old Athens station.

ADMINISTRATION.

A—Law 1831, passed January 14th, 1920.

B—Regulations for the Wireless Service of the Merchant Fleet.

C—Royal Decree concerning the Qualifying Examinations for Operators of Private Wireless Telegraph Stations.

D—Form of Ship Licence.

E—Form of Radio Operator's Licence.

F—Law 3054 (1924) Private Radiotelegraphic and Radiotelephonic stations.

G—Regulations under above law.

LAW 1831.

A Concerning the organisation of the Radiotelegraphic and Radiotelephonic Service of the State and the formation of a Directorate of Radiotelegraphic Service of the Navy.

Passed, January 14th, 1920.

(Modifications introduced December 27th, 1923, to Articles 1-5 are printed in italics).

CHAPTER A.

General Clauses concerning the Radiotelegraphic and Radiotelephonic Service of the State.

ART. 1.—The installation and operation of Radiotelegraphic and Radiotelephonic Stations on Hellenic territory and on board Hellenic ships constitutes a State monopoly.

No private wireless land station, either for transmission or reception, may be delivered or installed without a special licence, and all such licences granted before the publication of this amendment are considered cancelled.

In time of mobilisation of the naval or military forces the licence for the operation of private stations may be revoked without notice.

The State may take possession of private stations for its own use in mobilisation time after paying compensation as mentioned in the licence.

The State reserves to itself the right to purchase any private station in time of peace and if the licence be revoked in accordance with the first paragraph of the present article after a certified decision of the permanent advisory board as in Article 8, compensation is fixed by a council of arbitrators composed of three members, one chosen by the competent Ministry, the second by the owner, and the third by the President of the Athens Court of Appeal.

If more than one owner is interested and these do not agree as to the choice of an arbitrator, each of them shall propose one, and the arbitrator shall be chosen from them by ballot in the presence of the arbitrator chosen by the President of the Court of Appeal.

Such a Council settles definitely any dispute regarding compensation due for the temporary seizure of the station.

Licences for private wireless telephony stations may be granted, by permission of the Advisory Board of Wireless Services, provided that their range does not exceed 50 kilometres and their wavelength is less than 300 metres.

ART. 3.—Radiotelegraphists operating private wireless stations must be in possession of a licence issued by the State after successful examination, and undertake the obligation to preserve the secrecy of correspondence.

Licences are valid for a term of three years and a stamp of 10 Drs. is affixed to them. When Greek subjects are concerned, the application for the issue of the licence must be accompanied by certificates proving that the applicant is not a deserter from Government Forces and has not been convicted in accordance with Article 22 of the Penal Code.

Licences for Radiotelegraphists issued before the promulgation of this law are not valid after the lapse of one year.

Persons possessing wireless apparatus must, within a fortnight after the publication of this amendment, either export them from Greece or deliver them to one of the depots of the Radiotelegraphic Service. Otherwise they will be considered as owning unlicensed wireless stations, and will be prosecuted according to Article 4 of the Law, No. 1831, as at present modified.

ART. 4.—Shall be liable to a penalty not exceeding 20,000 Drs. and to imprisonment for a term not exceeding one year.

1. Every person who establishes a radio station or sets any radio apparatus on land or on board ship without a licence.

2. Any person employing an operator not holding a State licence.

3. Any person violating the terms under which the licence of installation of wireless station has been granted.

4. Any person who sends or transmits any fraudulent distress signal or who without lawful excuse interferes with or obstructs any radio communication of other stations as well as persons exhorting operators to transmit such signals.

5. Any person causing damage or destruction to the radio apparatus.

6. Any person violating the regulations in force.

7. Any person violating the due secrecy of the radio communication.

The above penalties are imposed by the Athens Court of First Instance on the action of the competent Minister without excluding any penalty provided by the Penal Code or by the Military Penal Code in the event of a Military case.

The same Court can order the confiscation of the station whenever it might be deemed desirable according to circumstances.

In addition to the above penalties the Minister can order, when he takes cognisance of such infringement of the above regulations, a temporary cessation of the service of the station confiscated, also the set and any apparatus necessary to the wireless service.

The licence of an operator punished by the Court for one of the above cases is suspended temporarily or permanently on the judgment of the Court. Should the competent Minister think that the infringement effected by the operator is not serious as to demand action, or in the event of the operator being guilty of negligence, the Minister may punish him by suspending his licence for a period not exceeding three months.

The maximum penalty is now increased to 100,000 Drs.

ART. 5.—The land stations of the State are divided into two classes:—

(a) Inland Radio stations for the transmission of official or private correspondence with ship stations or other Inland or Coast Stations of the State or Stations abroad providing that there are no private Wireless Stations.

(b) Shore or Coast Radio stations for the transmission of official or private correspondence to ships or other coast and land stations in the State or abroad, providing that there are no private stations for wireless correspondence.

The Government stations on board ships are divided into two classes:—

(a) Stations on board warships.

(b) Stations having been specially installed by the State on board merchant ships, exempted by the present law for the ships' particular use.

Any concession opposed to the present law is revoked.

ART. 6.—All wireless telegraphic subjects come under the special jurisdiction of the Ministries of Marine, of Communications, and of National Economy, who are kept *au courant* with wireless telegraphic questions in connection with merchant shipping by their representative and member to the Advisory Board (provided for by Article 8), the Director of the Merchant Shipping Department, or by direct communication of the Marine Minister providing special arrangements are made.

The following come under the special jurisdiction of the Minister of Communications:—

(a) The installation and operation of the land stations.

(b) The issue of licences for the installation and operation of private land stations, the inspection and supervision of their operation, the observance of the regulations in force and the conditions stipulated in the licence of these stations upon decision of the board provided for in Article 8.

(c) The control and payment of accounts for private radiograms transmitted by stations under his jurisdiction, or that of the Minister of Marine who in turn transmits full information concerning the subject.

For this purpose the staff of the office of the Ministry of Communications shall be fixed by special Royal Decree.

The following come under the jurisdiction of the Ministry of the Navy:—

(a) The installation and operation of the coast stations, of warship stations, and stations of the State on merchant vessels.

(b) The issue of licences for the installation and operation of private stations on merchant vessels and private coast stations after consultation with the Advisory Board, the inspection and supervision of their operation, the observance of the regulations and conventions in force and conditions stipulated in the licence of the station.

(c) The issue of licences to the operator of all stations.

(d) The control of ships or land stations and the observance of rules and conventions shall be fixed by Royal Decree and special regulations.

(e) As coast or shore stations are considered all stations installed a small distance from the coast if they keep up Naval radio-communication.

ART. 7.—Temporarily and until the formation of a Technical Service has been effected at the Ministry of Communications all matters under its jurisdiction except those stipulated in Chapter C will pertain to the Ministry of Marine.

ART. 8.—A permanent Advisory Board is established at the Ministry of the Navy, composed of the Head of the General Staff of the Navy as Chairman, the Director of Posts and Telegraphs, the Director of the Radio-Service of the Navy, the Head of the Radio Department of the Ministry of Communications, and one officer of the Army General Staff appointed by the Chief of the Staff, and of the Director of the Merchant Shipping Department in the Ministry of National Economy.

This Board considers:—

(a) The necessity for the erection of land stations.

(b) The issue of licences for the installations of private stations in the interior or on the coast and the cancellation of such licences.

(c) Matters pertaining to International Conventions.

(d) Questions arising between different services.

(e) Any relative matter brought forward by the Ministers of the Navy and Communications or of the Ministry of National Economy.

ART. 9.—The coast station charges and ship charges are fixed by Royal Decree according to circumstances after the consultation with the Advisory Board.

CHAPTER B.

CONCERNING THE RADIO-SERVICE ON BOARD MERCHANT SHIPS.

ART. 10.—All Greek merchant ships of 1,600 gross tonnage and over, and ships of less tonnage if they carry fifty or more persons including crew, must be fitted with a radio-telegraph set. The following are exempted from the above obligation:—

(a) Cargo-boats and sailing vessels whose voyages are not extended to an ocean.

(b) Passenger ships whose voyages are included in the parallelogram limited by 34° 0' to 42° 20' north latitude and the meridians 17° 0' to 30° 0' east of Greenwich. Passenger boats below 500 gross tonnage, undertaking fixed voyages further than the meridian 30° east of Greenwich, but in the area included by the above parallelogram, may also be exempted by decision of the Ministers of the Navy and National Economy.

In reckoning the number of persons stated in the first paragraph of this article, there are not included persons embarked exceptionally and temporarily as the result of *force majeure*, or

because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry shipwrecked or other persons.

ART. 11.—The power of the wireless sets provided for in the foregoing article will be defined in the licence and shall be able to transmit signals clearly under normal circumstances at a distance of at least 100 nautical miles, in addition they shall be equipped with an emergency gear which elements shall be under the greatest safety conditions.

ART. 12.—The clearance of ships, subject according to Article 10 to carry a wireless set, and not being fitted therewith, is prohibited by the harbour authorities. The acceptance of Greek passengers on ships of foreign nationality which are not equipped with wireless is also prohibited for voyages where Greek ships are required to be equipped.

ART. 13.—Merchant ships exempted from the obligation to be fitted with a wireless set may be fitted with State apparatus for purposes of the War-Navy. All expenses of installation and maintenance of the necessary staff for the operation being reserved to the competent Ministry.

ART. 14.—All ship radio-charges are deducted from the general radio-charges and belong to the shipowner or to any person having the exploitation of the radio-station under special arrangement with the shipowner.

In cases where the ship helps in salvage or affords assistance to another ship in consequence of a radiogram the shipowner is required to pay to the State 10% of the net sum which he obtains for salvage, but only if the apparatus belongs to the State, this sum being devoted to the *Naval Caisse des Invalides*.

CHAPTER C.

CONCERNING THE RADIO-SERVICE OF THE NAVY.

ART. 15.—A Direction of Radio-Service of the Navy is formed in the Ministry of the Navy under the immediate orders of the Minister of Marine and to which, in addition to matters specified in Article 6 of this law, are subject: The enlistment, training, appointment and alterations of the staff serving on stations subject to the jurisdiction of the Ministry of the Navy or any other relative matter to be fixed by Royal Decree.

(Further articles concern the special service of the Naval Radio-Corps.)

REGULATION OF WIRELESS SERVICE ON MERCHANT SHIPS.

CHAPTER I.

SHIPS BOUND TO BE FITTED WITH RADIO-TELEGRAPH INSTALLATION.

B 1. All Greek merchant ships of 1,600 gross tonnage and over, and ships of less tonnage, if they carry fifty or more persons including crew, must be fitted with a radiotelegraph set. The following are exempted from the above obligation:—

(a) Cargo-boats and sailing vessels whose voyages are not extended to an ocean.

(b) Passenger ships whose voyages are included in the parallelogram limited by 34° 0' to 42° 20' north latitude, and the meridians 17° 0' to 30° 0' east of Greenwich. Passenger boats below 500 gross tonnage, undertaking fixed voyages further than the meridian 30° east of Greenwich, but in the area included by the above parallelogram may also be exempted by decision of the Ministers of the Navy and National Economy.

In reckoning the number of persons stated in the first paragraph of this article there are not included persons embarked exceptionally and temporarily as the result of *force majeure*, or because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry shipwrecked or other persons.

2. The power of the wireless station on merchant ships is fixed by the Direction of the Radiotelegraphic Service of the Navy (D.R.S.N.), and is prescribed in the licence according to the voyages undertaken by the various ships. As a minimum limit should be taken the clear transmission of signals to a distance of at least 100 naval miles under normal conditions. In addition merchant ships must be fitted with an emergency set, the whole system of which must be kept in the safest condition. The accumulators must be placed out of the wireless cabin and if possible in the open air in dry cases. The wireless cabin must be connected with the bridge by some safe means assuring verbal communication.

3. Each shipowner, obliged by this law to install a radiotelegraph station on his ship, must submit an application to the D.R.S.N. (Inspection Department) for the necessary licence.

In the application the following items of the ship must be prescribed:—

- (1) Dynamo—how driven and where placed.
- (2) Masts—distance between and height.
- (3) Capacity (deadweight).
- (4) Passenger or cargo.
- (5) Number of crew.
- (6) Voyages undertaken.
- (7) System of the radiotelegraphic station to be installed.
- (8) Length of aerial.
- (9) Wave system.
- (10) Wavelengths used.
- (11) Emergency set.

After the installation the shipowner submits to the D.R.S.N.:—

- (1) Small drawing of the aerial.
- (2) Small drawing of the connections.
- (3) Disposition of the set in the cabin.

The responsibility for the accuracy of these certificates is borne wholly by the shipowner.

The D.R.S.N. on granting the necessary licence can accept the above items or change them, the shipowner being obliged to comply with the suggestion of the D.R.S.N.

4. Shipowners not bound by law and wishing to install a radio set on their ships must apply by a similar application as above.

5. The D.R.S.N. on granting a licence assigns the call letters to the station.

6. Merchant ships are divided into three classes, A, B, C, as regards the wireless installation:—

Class A.—To this class belong all the passenger ships travelling at a distance of more than 200 miles from the coasts. The ships of this class must be in permanent watch.

Class B.—To this class belong all other ships which are bound by law to be fitted with a radiotelegraphic installation; the ships of this class are bound to keep limited watch during the voyage which is regulated in accordance with the needs of the voyage. In any case the station of these ships must be in watch the first ten minutes of each hour.

Class C.—To this class belong all ships fitted with wireless installation without being bound by law. The station of these ships have no fixed watches.

CHAPTER II.

SERVICE OF WIRELESS STATION ON MERCHANT SHIPS.

9. The wireless stations service of Greek merchant ships must be carried out by telegraphists holding a Greek licence granted in accordance with Law 1831 by the D.R.S.N.

10. The stations of ships of class A are served by two operators at least, one of whom must hold a first-class licence.

11. The stations of ships of class B are served by at least one operator holding a first-class licence.

In cases where no second operator is carried a member of the crew must be able to understand the distress signal or the call of another station, so that he may at once inform the telegraphist.

The skill of the said member of the crew shall be tested and mentioned in the respective report of the Wireless Inspector.

12. The station of a ship of the C class must be served by at least one operator holding a second-class licence.

13. The operator of the ship in charge of the station is responsible for the regular carrying out of the service, the keeping up of books, the cleaning and maintenance in good order of the apparatus. The other operator must obey him.

14. Each merchant ship station must be supplied with the following papers:—

(1) The licence for the installation.

(2) A copy of the present Wireless Regulation and of any other subsequent or of any circular concerning the radiotelegraphic service.

(3) A copy of the International Wireless Convention and of annexed regulation.

(4) The official list of wireless stations and alphabetical list of call letters.

(5) Radiogram prints.

(6) A copy of the standing wireless and cable rates and the protocol of the wireless station.

(7) A log-book for the wireless station.

The operator will state from time to time on a slate placed out of the wireless cabin the coast station with which he is in touch.

15. The operator on service shall keep in a log-book of the station a record of all orders received and all other observations connected with the wireless service and any infringement of the regulations.

The log-book of the station will be considered as an official document and it is forbidden to detach leaves therefrom or to use erasers on its pages. It may thus serve as means of proof before the courts and the competent authorities.

16. The wireless station on a merchant ship and the operators serving it are under the direct orders of the captain who regulates their watch on his own responsibility. But the operator is responsible for any signal or call of the station or any message which he receives and has not passed in the protocol of the station.

17. The captains of the merchant ships must take the necessary steps to secure during the voyage the necessary electric power for the transmitting set for the regular service of the station.

18. When the captain, on his own responsibility, forbids communication or orders silence to a station's call, or in general gives orders to the operator contrary to the regulations or hinders the operator in the fulfilment of his duties in any way, the latter must call the captain's attention to the fact, and if the captain insists, the operator must obey stating the fact in his log-book, and as soon as the ship arrives

at a Greek port he must report the case to the wireless inspector or in the latter's absence to the harbour master.

19. The correspondence and the service in general of merchant ships is carried out in accordance with the regulations annexed to the International Radiotelegraphic Convention of London and with the present regulations, as well as with any other order of the D.R.S.N.

Operators are also bound to carry out all orders and to comply with the instructions given by the wireless inspector.

20. On no account may a ship station use other call letters than those prescribed in the licence.

21. The transmission of radiotelegrams in harbours or bays in the proximity of coast stations is prohibited.

22. Merchant ship stations are bound to suspend transmission as soon as a coast station requires it. As a general rule the ship stations must comply with the orders given by the coast stations.

23. In time of mobilisation or Naval manoeuvres the ship stations must conform to the instructions given by the Greek Navy.

24. Before leaving port the operator in charge of the station must try the working condition of the main and emergency set. This test, however, is carried out by disconnecting the aerial. Whenever the operator thinks it necessary to verify the radiation of the station and its emergency set or the sensitivity of the receiver he applies for it, using the international abbreviation.

25. The operators in charge of merchant ships are bound, when they proceed to a Greek harbour, to report at once to the wireless inspector or to the harbour officer all deficiencies of the station and in his personnel.

26. The captain is bound at specified intervals not exceeding four hours to give the operators the position of the ship which is to be constantly suspended under their view in the receiving cabin.

27. The operator receiving (by any means knowledge of a message dangerous to the interests of the country must report it at once to the captain and to the nearest Government coast station or warship or harbour authorities, and simultaneously must draw up a report embodying the message, the station in communication, and full information on it, which he forwards to the D.R.S.N.

28. If the wireless operator receives a suspicious message for transmission from a passenger, before transmitting it he must ask the permission of the captain.

29. It is forbidden for operators to undertake service at a station not fitted with a regular licence.

30. All operators must carry their licence in the ship to which they belong.

31. It is forbidden for operators to maintain communication by wireless on subjects not referring to the wireless service.

32. Whenever the operator hears any infringement of the rules effected by other stations he must report at once the fact with all necessary particulars to the D.R.S.N., and he will record in his log-book exactly what he has heard.

33. It is absolutely forbidden for a third station to interrupt two stations already communicating.

34. As a general rule wireless operators must constantly recognise that it is of their duty

to enable the wireless communication to be carried out regularly and not to be absorbed exclusively by the finishing up of their service in the station they belong to.

35. It is forbidden to every person not concerned in the service of the station to enter the wireless cabin.

36. Captains are bound to supply the necessary personnel for the cleaning of the station and the repair of the aerial and of the set and generally to grant all assistance for the maintenance and regular service of the station.

37. Merchant ships' operators hold officer's rank of the merchant fleet.

38. Operators on finally landing from a merchant ship must present their licence to the captain before landing, who endorses on it the capacity and character of the operator as shown during his service period.

CHAPTER III.

PENALTIES FOR THE VIOLATION OF THE LAW AND THE REGULATION.

39. Shall be liable to a penalty not exceeding 20,000 Drs. and to imprisonment for a term not exceeding one year.

(1) Everyone who establishes a wireless station or sets any radiotelegraphic apparatus on land or ship without a licence.

(2) Any person employing an operator not holding a State licence.

(3) Any person violating the terms under which the licence of installation for wireless has been granted.

(4) Any person violating the regulations in force.

(5) Any person who sends or transmits any false or fraudulent distress signals or who without lawful excuse interferes with or obstructs any radio communication of the station.

(6) Any person causing damage or destruction to the radiotelegraph apparatus.

(7) Any person violating the due secrecy of the radio communication.

(8) Any person violating generally any regulation of the rules in force.

40. The above penalties are imposed by the Athens Court of First Instance on the action of the competent Minister without excepting any penalty provided by the penal code or by the military penal code in the event of military case.

41. The same court can order the confiscation of the station whenever it might be deemed desirable according to circumstances.

42. In addition to the above penalties the Minister can order, when he takes cognisance of such infringement of the above regulations, a temporary cessation of the service of the station confiscated, also the set and any apparatus necessary to the wireless service.

43. The licence of an operator punished by the court for one of the above cases is suspended temporarily or permanently on the judgment of the court. Should the competent Minister think that the infringement effected by an operator is not so serious as to demand such action, or in the event of the operator being guilty of negligence, the Minister may punish him by suspending his licence for a period not exceeding three months.

CHAPTER IV.

INSPECTION OF THE WIRELESS STATIONS OF MERCHANT SHIPS.

44. In harbours specified by order of the Minister of Marines there are centres for inspection of wireless in active service.

45. In these centres there are Inspectors of the corps of the wireless operators of the War-Navy to superintend the application of Law 1831 of the International Convention and the Regulations for Wireless Telegraphy which are in force.

46. The Inspectors communicate directly with the harbour officers and co-operate with them in order to enforce the law.

47. The Wireless Inspectors, or failing them, the harbour officers, inspect the ships affected by the law before their departure and verify whether they are fitted with wireless as well as with the necessary personnel and the class of operators in accordance with the law and the present regulations.

48. The Wireless Inspector who discovers an infringement of the law or the regulations reports it simultaneously to the harbour master who either prevents the leaving of the ship in accordance with law or reports the infringement effected to the D.R.S.N., asking for the suspension of the responsible operator or the imposition of a penalty according to the nature of the infringement effected.

The Harbour Master accompanies such report with a detailed report concerning the transgression committed, signed by him and the Wireless Inspector, and if need be accompanied by a sworn statement to this effect, which he may obtain from any person acquainted with the fact. He also submits any other item which might be useful to the court.

49. If the inspection of the ship station is impossible the Inspector or the Harbour Officer can ask for a written statement from the captain testifying that the station is maintained in good condition.

50. The Wireless Inspector can accept as a proof of the efficiency of the set and the capacity of the operators of the ship under examination, radiograms transmitted or received during the lapse of the last voyage to the harbour where they are from a distance of at least 100 miles.

51. For any obstruction or difficulty caused by the captain or other person of the ship with regard to the service and the duties of the Inspectors or the Harbour Officers the captain of the ship will be held responsible and against whom the Harbour Master may at once order legal proceedings to be taken.

52. The captain is responsible if he sail from any harbour where there is an Inspector without having his wireless installation in order or the requisite number of operators.

53. All consequences of the law concerning the infringement of the regulations will be enforced against the captain or the shipowner or against both according to the circumstances.

C ROYAL DECREE CONCERNING THE QUALIFYING EXAMINATION FOR OPERATORS OF PRIVATE WIRELESS TELEGRAPH STATIONS.

ART. 1.—Any person desirous of taking out a licence for wireless telegraphy (class A or B), or of renewing the one he already possesses, must forward, on or before the 25th of the month preceding the date of the examination, the following particulars to the Wireless Telegraphy Department of the Navy:—

(1) An application on a form bearing a stamp to the value of 50 lepta, and, in addition, a stamp of 60 lepta, for the licence he wishes to obtain. In this application must be recorded the system, selected from those in use on board of Greek ships, on which the candidate wishes to be examined.

(2) If the candidate is a Greek citizen, a certificate from the Mayor or President of his

Community, relating to the record of the candidate in the register of males. For foreigners a certificate from their respective Consular authorities is required.

(3) Certificates from the Prosecutor of the First-Instance Court and Court of Appeal to the effect that he has not been sentenced to any penalty provided by Art. 23 and 24 of the Penal Code.

(4) Certificate from the Recruiting Department, if the candidate is a Greek subject, to the effect that he has accomplished his military duties, or is not yet liable for military service.

(5) A quittance of payment to the Paymaster of the Wireless Telegraphy Department of the Navy, to the value of 50 drachmas, representing the examination fees, and serving as a recompense to the examining committee. These examination fees are reduced to one-half for those serving in the Navy or in the Army for the whole period of service, or in the event of their passing the examination within three months after their discharge from the ranks.

(6) Candidates for a first-class licence must forward a certificate from the captain of a ship or the chief of a land station to the effect that they have actively served in a wireless station, public or private, during six months at least.

ART. 2.—The examination takes place in the Main Wireless Station of Athens, during the first ten days of the months of January, April, July and October.

ART. 3.—Persons desirous of obtaining a licence in classes A or B, or of renewing that already in their possession, must pass the following examinations:

Syllabus of examination comprises:—

- (a) Written examination in general knowledge of electricity.
- (b) Practical examination in manipulation.
- (c) Practical examination in receiving.
- (d) Oral examination in use of apparatus, detection of faults, etc.

(e) Written examination in rules and regulations.

ART. 4.—To successfully pass the B class licence examination the candidate must get at least 60 per cent. of the highest possible marks in the (a) examination, and 70 per cent. in each of (b) (c) (d) and (e).

To successfully pass a first class licence examination, the candidate must obtain at least 70 per cent. of the highest possible marks in the (a) examination, and 75 per cent. at least in each of (b) (c) (d) and (e).

ART. 5.—The Examining Commission is composed of three members chosen from the officers or civil engineers of the Naval Wireless Service Department, and nominated by order of the Director.

When the examination is finished the President of the Commission submits the results to the Director of the Naval Wireless Service, who grants the licence.

FORM OF SHIP LICENCE.
KINGDOM OF GREECE.

No.....
DIRECTION OF THE NAVAL RADIOTELEGRAPH SERVICE.

D In accordance with Law 1831, with the London Wireless Convention of 1912, and with the Regulations on the Wireless Service of the Merchant Fleet we grant the licence for the erection and operation of wireless station on board s.s. of..... tons deadweight, registered at..... Belonging to.....

The technical particulars of the station are as follows:—
Station Class Call letters
Power System
Aerial length Wavelength
Receiver
Emergency set
Electric power
Staff

Back Part.

Locality and date of birth.....
Remarks
Signature.....

PHOTO

SERVICE CONTROL.

Station Name.	Service Time.	Remarks.	Signature of person in charge or of the Captain.

The operation of the station is subject to the provisions of the above laws, conventions and regulations, as well as to the provisions of all regulations issued by the Direction of the Naval Radiotelegraph Service.

The present licence is valid as long as the London Convention of 1912 is in power, and is revocable for any case referred to in Law 1831.

Athens, the.....19..
The Director of the Naval Radiotelegraph Service.

KINGDOM OF GREECE.
No.....
DIRECTION OF THE NAVAL RADIOTELEGRAPH SERVICE.

OPERATOR'S LICENCE.

..... CLASS.
E Mr..... has been examined successfully on the following matters:—
(a) Operation and regulation of apparatus,

(b) Transmission and reading of signals at a speed of at least.....words per minute.

(c) Knowledge of the regulations on the wireless communication.

The above-mentioned has undertaken the obligation of maintaining the secrecy of Radio communications, and therefore the present licence is granted, owing to which he may undertake Wireless service in Greek merchant vessels as well as at land stations.

The present licence is valid for a term of three years beginning to-day and as long as the London Convention of 1912 is in force.

The present licence is temporarily or definitely revocable for any obstruction, according to Article 4 of Law 1831, of which he has knowledge.

Athens the.....19..

The Director of the Naval Radiotelegraphic Service.

F

LAW 3054, 1924, CONTROLLING THE INSTALLATION OF PRIVATE RADIO-TELEGRAPHIC AND RADIOTELEPHONIC STATIONS.

ART. 1.—Receivers employing frame aerials only, as long as they are designed solely for general communication, are excepted from the regulations under the Law No. 1831 as modified on December 27th, 1923.

ART. 2.—Licences for installing receiving apparatus are issued by the Ministry of the Navy, after consultation with the Advisory Board of Wireless and in accordance with the technical conditions prescribed by that Board. However, these clauses may be modified after the granting of a licence if the Advisory Board so decide, and, in the event of the licensee not agreeing to the new terms, the licence will be cancelled without any right of indemnity on the part of the owner.

ART. 3.—Private installations of wireless telegraphy and telephony are under the direct control of the Direction of Radiotelegraphic Service of the Navy, and its authorised inspectors are entitled at any time to ascertain that the clauses under which the licence has been granted are properly observed.

ART. 4.—For every licence granted for wireless telephony or wireless reception an annual indivisible tax of 500 drs. is charged for each independent complete set on behalf of the National Naval funds for the period from January 1st to December 31st each year. If the installation is not confined to the personal use of the applicant, but is intended for communication, public or commercial use, the above tax, for each individual set, is fixed at 5,000 drs. annually, payable to the National Naval fund.

ART. 5.—A Decree will be issued fixing the technical conditions under which such licences will be granted.

REGULATIONS

G

PRESCRIBED UNDER ABOVE LAW No. 3054.

ART. 1.—Private wireless receiving installations working in accordance with Law 3054 must fulfil the following conditions, which will be strictly noted in granting licences :—

(1) A receiving station must be fitted with frame aerial only, an outside aerial being forbidden.

(2) Reception of wavelengths below 2,000 metres is forbidden, in order that the short wavelengths used for public correspondence may not be intercepted.

(3) Reception is allowed only of general calls or communications (CQ) or experimental calls. The interception of any kind of personal or public correspondence is strictly forbidden.

The communication of the contents of any message which may by chance be received other than those of a general character as specified above must not be written down or communicated to anyone.

(4) Receiving stations must not interfere with any other station, but, in the event of such an occurrence, the Government will not assume any responsibility for such mutual interference.

The granting of a licence does not carry any privilege and cannot constitute any obstacle to the granting of similar licences to any other applicants.

(5) On the form of licence the Christian and Surname of the licensee is to be written, together with the exact address where the apparatus is to be installed.

Transference of a licence to a third person is forbidden. Leave to remove the set to another building can be obtained upon the approval of the Direction of the Radiotelegraphic Service of the Navy.

ART. 2.—Application for the installation of a wireless receiver must be submitted to the Ministry of the Navy (D.R.S.M.) duly stamped. In this application must be recorded the following particulars : Name, surname, occupation and address of the applicant. Purpose for which the set is to be installed ; longest wavelength to be received ; shortest wavelength to be received ; dimensions of frame aerial and number of turns of wire ; particulars of apparatus to be used, and the system to be employed ; diagram of connections ; a special diagram showing the layout of all the apparatus, complete with frame aerial, may be submitted.

ART. 3.—Licences for the installation of wireless receivers are granted only to Greek subjects. The Advisory Board, before issuing such licences, may demand any certificate which they deem necessary regarding the nationality and general character of the applicant.

ART. 4.—The inspection of private wireless installations is carried out by the Government agents and officials of the D.R.S.M. These inspecting officers must carry a written authorisation from the Director of R.S.M., which will be presented at each inspection. Inspection can be ordered by the Director of R.S.M. at any time or day. Entrance to the inspectors must be permitted, and all particulars demanded must be furnished.

ART. 5.—Upon the decision of the Advisory Board to grant a licence for a private installation, the applicant must pay in advance to the funds of the National Navy the annual tax. The licence is only granted upon presentation of the receipt for such payment.

The D.R.S.M. will advise the National Naval Fund of any licences cancelled, to assist in the estimates for the annual taxes.

HOLLAND (Netherlands).

(See Map 11).

CONTROL.

EXCEPT in so far as the Navy, the Army, Civil Aviation, and the Colonies are concerned, wireless telegraphy is in the hands of the Director-General of Posts and Telegraphs under the supervision of the Minister of Waterways.

Stations on ships at sea may not be established or worked by private enterprise without a licence issued by the Queen. The general conditions which are imposed are laid down in the form given below.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Minister G. J. Van Swaay ..	Minister of Waterways ..	Gravenhage
Mr. W. D. Nolting	Director-General of Posts and Telegraphs	Gravenhage
.. .. .	Chief Engineer, Director of Telegraphs	Gravenhage
Mr. J. A. Blandvan den Berg	Inspector of Coast and Ship Radiotelegraph Service	Gravenhage

ADMINISTRATION.

In 1919 Parliament passed the Bill (presented by the Minister of Agriculture, Industries and Commerce in 1916) to give effect to the International Convention for the safety of Life at Sea. This Act (Shipping Convention Act of April 5th, 1919) is in agreement with the Articles of the Convention, but has not yet come into force.

Regulations regarding broadcasting are in course of preparation.

The various Amateur Wireless Societies in Holland have now been organised under the auspices of the Nederlandsche Radio Unie of Amsterdam.

The Netherlands possesses important colonies in the East Indies, as well as in South America, and the wireless laws and regulations current in those colonies are appended in the following pages.

The text (so far as radiotelegraphy is concerned) of the following enactments figure below :—

A—Telegraph and Telephone Act of 1904 (supplemented and amended 1919).

B—Royal Decree, 6th March, 1905 (modified 1914 to 1921).
Modifying Act of 1904.

C—Royal Decree, 9th July, 1921, concerning use of Receiving Apparatus.

D—Royal Decree, 22nd November, 1921, concerning transmission of messages.

E—Royal Decree, 11th December, 1922, concerning messages from ships.

F—Prescription issued by Minister of Waterways concerning Foreign Vessels.

G—Licence for Ship Station.

H—Licence for Experimental Station.

I—Article of Penal Code, concerning Violation of Secrecy.

COLONY OF CURAÇAO.

J—Public Notice No. 52, of 1909, concerning Telegraphic Communication.

K—Public Notice, No. 25 of 1923, modifying Penal Code.

DUTCH EAST INDIES.

L—Regulation for Telegraph Service.

TELEGRAPH AND TELEPHONE ACT OF 1904.

A The Telegraph and Telephone Act of 1904 mainly refers to the ordinary wired services, and it has not been judged worth while, therefore, to reprint it in full here.

According to Article II of this Act, a licence granted by the Queen is necessary before telegraphs and telephones can be established or worked by private enterprise. The Act also contains the terms under which the licence is issued and the conditions binding on the licensee.

The above provision is also applicable to wireless telegraphy.

Article III prescribes that for the establishment and the use of radiotelegraph and telephone stations not destined for general public service an authorisation from the Minister of Waterways is required.*

ART. IIIA.—It is forbidden to work radiotelegraphs and telephones, be they destined for public service or not, on board vessels other than of Dutch nationality when within territorial waters, or in waters within the territory of the kingdom, unless it be done in accordance with the prescriptions fixed by the Minister of Waterways (see "F").

For the radiotelegraphs and telephones referred to in the first part of this Article neither licence nor authorisation is required unless they are within the territorial waters of the kingdom and without the licence required in virtue of the International Telegraph Convention (with Regulations) of London such as it is at present constituted (Staatsblad 1913, No. 132) or may be constituted, also as it may be modified for the Netherlands.

GENERAL REGULATIONS.

B **ROYAL DECREE OF THE 6TH MARCH, 1905.** (State Paper No. 90), for the institution of general Government Regulations as contemplated in Art. 12 of the Telegraph and Telephone Code, 1904 (State Paper No. 7), as modified by the Royal Decree of the 11th July, 1914 (State Paper No. 302) of the 15th November, 1919 (State Paper No. 753), and of the 9th July, 1921 (State Paper No. 903).

ART. 1.—Unless provided with a licence from our Minister of Waterways and with due regard to the terms and stipulations set forth therein for the prevention of the interruption of the working of telegraphs and telephones intended for the service of the public, it is forbidden to erect or to use:—

1. (a) Any overhead electrical conductor for purposes of lighting or the transmission of motive power situated within less than 6 metres in horizontal distance from any overhead conductor belonging to the Telegraphs and Telephones intended for the service of the public;

(b) Any other overhead electrical conductor situated within less than 2 metres in horizontal distance from any overhead conductor belonging to Telegraphs and Telephones intended for the service of the public;

2. Any underground electrical conductor situated at less than 0.50 metres distance

from any underground conductor belonging to Telegraphs and Telephones intended for the service of the public; electrical conductors inside buildings are not comprised among the conductors mentioned in 1 and 2.

The licence referred to under paragraphs 1 and 2 is not required for electrical conductors and installations which were already in use when these Regulations came into force.

ART. 2.—It is forbidden to put any obstacles in the way of the working of telegraphs and telephones intended for the service of the public by means of any electrical conductor or installation.

ART. 2A.—Notwithstanding the stipulation contained in the preceding article, the possession and use of plant, which is merely suitable for the reception of wireless telegraphic and telephonic signals, are only permitted with due observance of the prescriptions which are laid down by our Minister of Waterways.

ART. 3.—The costs incurred in the carrying out of arrangements for the purpose of removing obstacles which have been placed in the way of the effective working of telegraphs and telephones intended for the use of the public by an electrical conductor of plant already in existence at the time of the installation of such telegraphs and telephones shall be borne by those who undertake the installation of the said telegraphs and telephones to such an extent as these costs may be approved by our Minister of Waterways.

ART. 3A.—The preceding articles of the Decree are equally applicable to telegraphs and telephones which are installed by the State but which are not intended for the service of the public.

ART. 4.—The carrying out of the prescriptions of this general measure of Government is entrusted to the police officers and officials of the State and the municipalities, the inspector in the coastal and ship wireless telegraph service, the chief engineers and engineers, the electro-technical chief officers and officers of the telegraphic service. The official reports drawn up by them are transmitted to the competent officer of the Public Ministry at the District Court, a copy of such reports being also sent to the Director-General of Posts and Telegraphs.

ART. 5.—Violation of the prescriptions set forth in Articles 1, 2 and 2 bis of this general Government measure is punishable, except in so far as it may otherwise be provided for by the law, by imprisonment for a period not exceeding 30 days or by a fine not exceeding 300 florins.

DECREE No. 622

RECEIVING ARRANGEMENTS FOR RADIOTELEGRAPHY AND RADIOTELEPHONY.

C By Royal Decree of July 9th, 1921 (Staatsblad No. 903), of which the text is given below, the Minister of Waterways is given authority to make regulations with which apparatus exclusively intended for receiving wireless telegraphic and telephonic signals shall comply, and furthermore penalties are decreed for non-observance of the rules.

Text of the Royal Decree of July 9th, 1921 (Staatsblad No. 903), containing supplement to and alteration of the Royal Decree of March 6th, 1905 (Staatsblad No. 90), finally revised in the Royal Decree of November 15th, 1919 (Staatsblad No. 753).

ART. 1.—After Article 2 of our Decree of March 6th, 1905 (Staatsblad No. 90) is inserted an Article 2 bis as follows:—

Without prejudice to the enactments of the preceding Article the possession and the

* NOTE.—Stations only suitable for the reception of radiotelegraphic signals are not considered as radiotelegraph and telephone stations.

use of apparatus exclusively fitted for the receipt of radiotelegraphic and radiotelephonic signals is only permitted subject to observance of the regulations which shall be made by Our Minister of Waterways.

ART. 2.—Article 4, first paragraph, of Our above-mentioned Decree, is to be read as follows :—

The officials of the Royal and Municipal Police, and the Inspectorate of the coastal and ships' wireless telegraphy, the chief engineers and engineers, electrotechnical head officials and officials of the Telegraph Service are charged with the maintenance of the general rules prescribed by the Government.

ART. 3.—In Article 5 of the Decree as given by Us the words "the Articles 1 and 2" are replaced by the words "the Articles 1, 2 and 2 bis."

ART. 4.—This Decree comes into force on the second day from the date of the Staatsblad in which it appears.

The Decree came into force on August 7th, 1921

The regulations of Art. 1 heretofore mentioned are :—

Text of the Ordinance of the Minister of Waterways of August 8th, 1921, No. 1, Department of Posts and Telegraphs.

ART. 1.—In this Ordinance is understood :—
By "Minister," the Minister of Waterways.

By "Director-General," the Director-General of Posts and Telegraphs.

By "signals," radiotelegraphic or radiotelephonic signals of any kind.

By "receiving apparatus," apparatus maintained by or used by others than the State, which is exclusively designed for receiving radiotelegraphic and/or radiotelephonic signals.

ART. 2.—It is forbidden to take note in any way of signals received which are intended for another, or to communicate their contents, the substance of them or their existence to a third party or to allow them to be so communicated.

ART. 3.—Users of receiving apparatus must observe all orders which are directed to them with reference to the apparatus by the Director-General or, in the cases set forth in Article 18 of the Telegraphs and Telephone Act, 1904 (Staatsblad No. 7) by the military authorities.

ART. 4.—The receiving apparatus is subject to any control which is deemed necessary by the Director-General or, in the case set forth in Article 18 of the Telegraphs and Telephones Act, 1904 (Staatsblad No. 7), by the military authorities.

The officials appointed by or on behalf of the Director-General or the authorities must always be allowed to inspect the apparatus, and note all that concerns the reception of messages.

ART. 5.—Users of receiving apparatus must notify the local Director of the Royal Telegraph Office or of a neighbouring Post Office if there is not one in the town. This is to be done by means of a form which can be obtained from all post offices free of cost.

On this form when completed must be shown :—

1. Surname and Christian names of the user of the apparatus, the date and the year of his birth, his town and address, and exact position where the apparatus is situated.

2. It must be stated whether valves or other apparatus are used which can send out waves obstructing wireless traffic.

3. That the user is acquainted with the regulations governing the use of the apparatus, and that he accepts them unconditionally, When the form is sent in an acknowledgment of receipt is issued by the Director of the Post Office in question. The user must be able to produce this receipt at all times, and in default it will be assumed that no form was completed.

ROYAL DECREE OF NOVEMBER 22ND, 1921, RELATING TO TRANSMISSION OF MESSAGES MARKED "BY WIRE."

(State Paper No. 1344).

D ART. 1.—Unless telegrams are provided with the gratuitous direction "By Wire," the Telegraph Administration are entitled to make use either of the wireless telegraphic service or of the line telegraphic service for their transmission.

A decision will be made by or on behalf of our said Minister and published in the official *Gazette* with respect to which telegrams use shall be made of the right indicated in the first paragraph.

This right is made use of with respect to telegrams handed in in Holland and destined for the United Kingdom and Germany, or for points beyond these countries and for the Dutch East Indies.

ROYAL DECREE OF 11TH DECEMBER, 1922 (OFFICIAL GAZETTE No. 668), FIXING THE RATES FOR TELEGRAPHIC COMMUNICATION IN CONNECTION WITH MESSAGES AND SIGNALS OF DISTRESS RECEIVED BY MEANS OF RADIO TELEGRAPHY FROM SHIPS AT SEA.

E ART. 1.—The Government radio-telegraphic service at Scheveningen Harbour gives information of messages obtained from ships by means of radiotelegraphy, and signals of distress received, by telegraph, to those who have applied for the same.

ART. 2.—The information referred to in Art. 1 is supplied on payment by the addressee of F.2.50 for each message, exclusive of the rate for ordinary or urgent local telegrams, or, as the case may be, for inland or foreign telegrams.

ART. 3.—This decree comes into force on the 1st January, 1923.

PREScription ISSUED BY THE MINISTER OF WATERWAYS.

REGARDING FOREIGN VESSELS.

F Regulations which are prescribed by the Minister of Waterways and which in as far as they do not differ from any international agreement, to which the Netherlands are, or will be bound, are valid for foreign radiotelegraphic or telephonic ship stations which are within territorial waters or in waters within the territory of the Kingdom.

ART. 1.—(1). It is forbidden to use radiotelegraphs or telephones be they destined for public service or not, installed on board of foreign ships within Dutch territorial waters or waters within the territory of the Kingdom, unless the prescriptions of this disposition are observed.

(2). Moreover shall, as far as waters within the territorial limits of the Kingdom are concerned, those stations only may be worked by consent of the Director-General of Posts and Telegraphs when due regard is given to the conditions prescribed in said permit.

(3). Contravention of the rules as set forth in parts 1 and 2 of this article is allowed under special conditions, the requirements of good seamanship should make this necessary.

ART. 2.—(1). Foreign ship stations may exchange telegrams or have a conversation with radiotelegraph or telephone stations destined for public service under reserve of the special rules, which might be valid for any one of these stations.

(2). The exchange of traffic with stations not destined for public service is permitted under reserve of the special rules which might be valid for any one of these stations, and in so far as in the opinion of one or more public stations, the general public radio telegraphic or telephonic service is not interfered with.

(3). All traffic of foreign ship stations is immediately to be suspended, as soon as such is requested by any Dutch coast station open for general public service.

ART. 3.—(1). It is forbidden that by means of foreign ship stations hindrance should be given to the exploitation or the use of Government radiotelegraphs and telephones be they destined for public service or not, or to the exploitation of other radiotelegraphs and telephones destined for public service.

(2). Foreign ships must cease working of their stations as soon as they observe or when they are informed, that their working gives rise to an interference as described in part 1 of this article.

ART. 4.—(1). The Minister of Waterways may suspend the working of foreign ship stations either completely or partly as soon as it is judged necessary.

(2). The Director-General of Posts and Telegraphs has equal competency as far as it concerns suspension at certain places or daily during certain hours.

The licensees of foreign ship stations are subject to and henceforth obliged to adhere to all regulations referring to radiotelegraphy or telephony which are prescribed by the International Radiotelegraph Convention with final protocol and regulations of London such as it is at present (Staatsblad 1913, No. 132), of, later on, also for Holland, might be modified, either are or shall be prescribed by any other International agreement to which Holland accedes or will accede.

LICENCE FOR SHIP STATIONS.

G ART. 1.—In this licence is meant—
By Convention: the Radiotelegraphic Convention with final protocol, signed in London on July 5th, 1912, and all alterations and additions; that may be made thereto.

By Regulations: the Regulations belonging to this Convention with all alterations and additions that may be made thereto.

ART. 2.—The licence is given for an indefinite period, and may be withdrawn at any time, after one year's notice.

The licence, or an authentic copy of it, should always be kept on the ship. It must be shown on request abroad if asked for by the persons authorised herein.

ART. 3.—System.—The licensee is obliged to choose a system capable of communication with the Government stations opened for public radiograms, and to make the installation comply with the International Laws and Regulations. The antenna input should be such as to enable a decrease down to 10 per cent. of the maximum input. If an emergency set is required, as set forth in Art. XI of the International Regulations, the source of power, and eventually the other parts of the installation,

must be fitted on or above the upper deck, and, furthermore, are subject to the rules to be made therefor by the Director-General of Posts and Telegraphs. In case the position of the wireless cabin does not give the telegraphist direct communication with the bridge, without leaving the operating room, direct communication must be established as may be required by the Director-General of Posts and Telegraphs.

ART. 4.

Hours of Service.

A. *First Class*.—On ship stations belonging to the first class, as stipulated in Art. 13, s. 3, of the Regulations, a continuous service is maintained. Except in cases of *force majeure* these rules should not be discarded without consent of the Director-General of Posts and Telegraphs.

B. *Second Class*.—On ship stations belonging to the second class, as stipulated in Art. 13, sec. 3, of the Regulations, the service is maintained during the hours indicated in the official list of radiotelegraphic stations. The hours of service are fixed in consultation with the Director-General of Posts and Telegraphs. Except in cases of *force majeure*, these rules should not be discarded without consent of the Director-General of Posts and Telegraphs.

C. *Third Class*.—Here the article only stipulates that the ship station belongs to the third class as indicated in Art. 13, sec. 3, of the Regulations.

ART. 5.

Information.

As for the station on shipboard the licensee is obliged to provide the Director-General of Posts and Telegraphs with all facilities and information necessary for the fulfilment of all legal requirements.

ART. 6.

Approval of the Ship's Station and of the Personnel.

The ship's station will not be put in operation until the Director-General of Posts and Telegraphs has approved the installation of the ship's station, together with the constitution and capacity of the service staff.

A written certificate of the approval of the installation provided by the Director-General before mentioned must be hung in a position where it can be seen, whether near to or inside the ship's station. Such approval is also required in respect of any alterations which it may be necessary to make.

A sum of 25 florins is charged for the provision of the first certificate of approval.

Officers to be appointed by the Director-General aforesaid shall have the right of access at all times to the station for the purpose of making an inspection and ascertaining whether it still satisfies the stipulated requirements.

A note will be made on the certificate referred to of the time at which the inspectors shall have taken place.

In proof that the capacity of the service staff satisfies the stipulated requirements, a certificate is granted by the said Director-General in which are set forth the class and the name, and this certificate likewise contains the assurance that the person in whose name it is drawn up, has given an undertaking to the said Director-General that he will observe secrecy in regard to all the telegrams which may come to his knowledge through the medium of the ship's station.

The certificate may be cancelled if the said Director-General is of the opinion that the person in whose name it has been made out is no longer complying with the stipulated requirements and is, in fact, acting contrary to the terms of the concession.

Information must be given immediately to

the said Director-General of any alteration which may have been made in the plant of the ship's station, which affects any term of the convention or of the regulations or of any change which may have been made in the service staff.

ART. 7.

Authorisation to work Station.

The licensee is authorised to exchange telegrams with stations opened to public correspondence, as well as with stations not destined for public wireless traffic, as far as this does not interfere with public correspondence; both authorisations hold good, subject to their not infringing any private rules which might be in force at any of these stations. All communication by a ship station must cease immediately upon the request of a Dutch coast station open to public correspondence.

ART. 8.

Wavelength.

In addition to the wavelength of 600 and 300 metres provided for in Art. 3 of these Regulations, other wavelengths less than 600 metres are used in some cases according to the provisions made by the Director-General of Posts and Telegraphs.

ART. 9.

Places where Transmission is Prohibited.

Apart from the conditions of the Regulations appertaining thereto, it is hereby forbidden without the consent of the Director-General of Posts and Telegraphs, and with due regard to the conditions under which it is given, to use the ship stations within Dutch territorial waters or any Dutch waters inside those limits, unless under special conditions the requirements of good seamanship make contravention of this rule a necessity.

ART. 10.

Cessation of Traffic.

The working of a ship station may be suspended either completely or partly if it is judged necessary to the general interest. Upon the order of the Director-General of Posts and Telegraphs, the service may be suspended at certain places or daily during certain hours.

ART. 11.

Approval according to Art. 2 of the Telegraph and Telephone Act.

The remaining conditions concerning the use, Service Regulations, and the rate of wages and hours of duty of the operators, must be submitted for the approval of the Minister of Waterways.

ART. 12.

Exchange of Telegrams.

The exchange of Telegrams is subject to the conditions of the Dutch Telegraph and International Regulations, and also the conditions concerning the public Dutch radiotelegraph service, as well as all modifications and supplements thereto.

ART. 13.

Ship Tax.

The ship tax amounts to.....

ART. 14.

Accountancy.

The settlement of taxes takes place according to the rules to be fixed by the Director-General of Posts and Telegraphs.

ART. 15.

Secrecy of Correspondence.

The licensee is obliged to observe secrecy in regard to all telegrams which may come to his knowledge by means of the ship station. He must make sure that no person other than the operator in charge of the station has any opportunity of learning the contents of said telegrams.

ART. 16.

Forwarding of Documents.

The forwarding of documents concerning the radiotelegraphic service must conform with the rules of the Director-General of Posts and Telegraphs made according to the restrictions mentioned in Art. XL of the Regulations.

ART. 17.

Obligation to erect, maintain and work to the satisfaction of the Ministry of Waterways.

In conformity with the declaration contained in Art. 26 of these stipulations, the concessionary binds himself to work the ship's station within a period of time to be fixed by the Director-General of Posts and Telegraphs on the occasion of his signifying his approval in terms of Art. 6. The erection, the maintenance, and working of the station must be carried out to the satisfaction of our Minister of Waterways.

ART. 18.

Control.

Officers appointed by the Director-General of Posts and Telegraphs are authorised to inspect the working of the station and its operators, and to supervise the station service generally. If required they may also take temporary control of the station, upon showing a written and signed authorisation.

ART. 19.

Distress Signals.

In sending or receiving distress signals it is allowable to depart from the conditions of this concession, provided such deviation is necessary for the benefit of the ship in distress. For the distress signal (which may also be given in cases of other accidents than those which may occur to the ship concerned) no other signal may be used except the signal • • • ——— • • • unless approved by the Director-General of Posts and Telegraphs.

ART. 20.

Meteorological Telegrams, Time Signals, and other Signals.

The licensee is obliged to adhere to the rules which are made by or on behalf of the Minister of Waterways with reference to meteorological telegrams, time signals, and other signals.

ART. 21.

Authorisation and Obligations Outside the Territorial Waters of the (Dutch) Kingdom.

Outside the territorial waters of the Kingdom the rules of this licence are valid in so far as they are not contradictory to the Laws and Regulations which hold good in the locality in question.

ART. 22.

Other Rules and Regulations.

Moreover, the licensee is subject to and henceforth obliged to adhere to all Regulations referring to radiotelegraphy which are prescribed or will be prescribed by Dutch law; by the Convention and the Regulations; or by any other International agreement to which Holland accedes or will accede; as well as to any modifications which may be deemed necessary for the execution of such Regulations.

ART. 23.

Annulment of the Concession.

The concession may be revoked by us:

1. If the ship's station has not been erected within one year from the granting of the concession.

2. By non-observance of the prescriptions of the telegraph and telephone code, 1904 (State Paper No. 7), of the terms in accordance with which this concession is granted, or of any stipulation of the national or international legal prescriptions described in this document.

3. If the ship mentioned in the licence ceases to be a Dutch ship.

ART. 24.

Further Obligations of the Licensee.

A. *First Class.*—The licensee must give immediate notice to the Director-General of Posts and Telegraphs when an altered service Regulation in consequence of Art. 4, last paragraph, of this licence is introduced, also when the ship on which the station has been fitted is out of commission or changes owners.

B. *Second Class.*—The licensee must give immediate notice to the Director-General of Posts and Telegraphs when an altered service Regulation in consequence of Art. 4, last paragraph, of this licence is introduced; also when the ship on which the station has been fitted is out of commission or changes owners.

C. *Third Class.*—The licensee must give immediate notice to the Director-General of Posts and Telegraphs if the ship on which the station has been fitted is out of commission or changes owners.

ART. 25.

Violation of Rules.

In addition to the withdrawal of licence mentioned in Art. 23, except in cases of *force majeure*, the licensee is fined from F. 10 to F. 1,000, at the discretion of the Minister of Waterways, for each violation of any rule laid down in this licence, of the said national or international legal prescriptions, as mentioned herein, and is fined from Fl. 1 to Fl. 100 for each day, after the period fixed for paying the fines, that he fails to adhere to the rules of this agreement.

Dating from the day on which the decision to withdraw the licence in consequence of Art. 23 has been taken, fines are no longer due. This article may be applied immediately. The said Minister decides the legal grounds for administering a fine; or the legality of a claim on grounds of *force majeure*.

In addition to the fine, the said Minister will decide to what cause the violation is due, to enable him to take action according to the contents of Art. 12 of the Regulations.

ART. 26.

Acceptance.

A declaration of agreement must be forwarded to the Director-General of Posts and Telegraphs, within the period fixed by him, intimating an acceptance of the terms of this licence.

LICENCE FOR EXPERIMENTAL STATION

HA licence has been granted to for use of wireless telegraphs and telephones, which are installed in the premises situate at in under the following conditions and in virtue of his undertaking to pay the costs, make good the loss and pay the interest which may be found to arise therefrom.

ART. 1.—The licence is granted until further notice.

ART. 2.—The use of the wireless telegraphs and telephones is limited to the carrying out of experiments.

ART. 3.—If the wireless telegraphs and telephones are used in such a way that energy is radiated outwards beyond the precincts of the premises, this may only be done by means of a transmitter for continuous waves of metres. The holder of the licence must, in the case of such use being made of the installation, employ a receiver in the premises where the experiments are being conducted, during the whole period of the carrying out of the experiments, which is capable of receiving damped waves of a length of 600 metres, so that any

demand made by any station, in accordance with Art. 4, may be complied with.

The call letters to be used are and these must be repeated times at the commencement and on the conclusion of the experiments.

Furthermore, the holder of the licence must have in his said premises a telephonic connection with the local telephone service.

ART. 4.—All the radiation of electrical energy must immediately be stopped whenever the interests of the national telegraph and telephone service, may be thought necessary by the national stations concerned, and by the term "service" is to be understood the service of all the national stations including those belonging to departments other than the department of the Minister of Waterways.

ART. 5.—The experiments may be conducted on from to

ART. 6.—The holder of the licence shall pay to the Government a fee of 100 florins per week—hour per annum.

ART. 7.—The use of the wireless telegraphs and telephones may be suspended wholly or in part whenever this is thought to be necessary, in the general interest, by the Minister of Waterways.

The work may be interrupted temporarily on the authority of the Director-General of Posts and Telegraphs during parts of the hours in which the experiments are being conducted.

ART. 8.—All licensees must carry out the provisions which may be required by or on behalf of the Minister of Waterways within the period stipulated by the latter.

ART. 9.—The officers appointed by the said Director-General of Posts and Telegraphs are charged with the superintendence of the wireless telegraphs and telephones.

In this connection access to the wireless telegraphs and telephones must be permitted at all times to these officers.

ART. 10.—No use may be made of the licence before it has been accepted by means of a declaration to be handed in before the.....

ART. 11.—The holder of the licence is liable, at the discretion of the Minister of Waterways, to a penalty of Fl. 100 to Fl. 1,000 for each violation of any stipulation of this licence, and to a further penalty of Fl. 1 to Fl. 100, likewise at the discretion of the said Minister of Waterways, for every day, after the lapse of the period named on the imposition of the major penalty, in which he continues in default or in the act of violation of the stipulation referred to.

No act of default is necessary for the application of the stipulation contained in this article.

The said Minister decides upon the existence of the grounds for the imposition of the penalty and the amount of the penalty, as well as any justification there may be for an appeal for reasons of *force majeure*.

ART. 12.—Without prejudice to the provisions indicated in the foregoing, the prescriptions for installations which are exclusively suitable for the reception of wireless telegraph and/or wireless telephone signals, as laid down by the Minister of Waterways (instruction of the 8th August, 1921, No. 1, Department of Posts and Telegraphs) in virtue of the stipulations contained in Art 2 *bis* of the Royal Decree of the 6th March, 1905 (Staatsblad 90), recently modified by Royal Decree of the 9th July, 1921 (Staatsblad 903), remain in force.

NEW ARTICLE OF PENAL CODE RELATING
TO VIOLATION OF SECRECY OF WIRELESS
CORRESPONDENCE.

Penal Code.

I ART. 441.—“Any person who communicates to another the contents of a message which has been received by means of a receiver which is under his charge or which is used by him for purposes of wireless telegraphy or telephony, when he has reason to suppose that such message is neither intended for him nor for the information of the public and if he has reason to believe that by so doing the contents of such message may be brought to the notice of the public and if such a publication actually takes place, or who makes public the contents of such message, is punishable by imprisonment for a period not exceeding three months or by a fine not exceeding 1000 florins.”

REGULATIONS FOR TELEGRAPHIC
SERVICE IN THE DUTCH COLONY OF
CURAÇAO.

Public Notice No. 52 of 1909. (21st September.)

J The Governor of Curaçao, in view of the desirability of replacing by new regulations the decree of the 30th October, 1873, regulating the inland and foreign telegraph communication of the colony as well as that of the 27th September, 1884, regulating telephonic communication, and having received the sanction of the Colonial Council, has determined on the following decree:—

ART. 1.—In this decree it is understood that telegraphs and telephones refer to the usual line-telegraphs and telephones as well as to radiotelegraphs and telephones.

ART. 2.—No telegraphs and telephones may be installed on any of the islands of the colony by others than the Government, unless a special permit is granted. Besides the special conditions, made in each case, the general rules are:—

(a) The erection, maintenance and exploitation should be carried out to the satisfaction of the Governor.

(b) The tariffs, conditions of use and service regulations must be submitted for the approval of the Governor.

(c) The concession may be granted absolutely or conditionally, but for no longer period than 25 years.

(d) The concession may be withdrawn by the Governor if the above rules or the special conditions are not followed.

ART. 3.—It is forbidden, without the permission of the Governor, to use radiotelegraphs or telephones, fitted on board foreign or private-owned Dutch ships, in the ports or anchorages of the colony, unless in special circumstances, the exigencies of good seamanship render it necessary to do so.

ART. 4.—Everybody may make use of telegraphs and telephones under the existing regulations. The transmission of telegrams or the conversation by telephone may be stopped or refused if in conflict with the safety of the colony, public order, or common decency.

The reasons for refusal or stoppage should be communicated to the party concerned.

The decision of the Governor may be invoked in such cases.

ART. 5.—For the public interest the Governor may put telegraph and telephone service under control or partially suspend it for an indefinite period.

ART. 6.—In case of war, or if any of the islands of the colony be placed under martial

law, if so desired the telegraphs and telephones may be put under Government control.

ART. 7.—Imprisonment of one day to six months and fines from 10 florins to 1,000 florins conjointly or separately will be inflicted on those who erect or exploit telegraphs and telephones, without the permission required as specified in Art. 2; or who on board private-owned ships, make unlawful use of the same (Art. 3).

The instruments may, in so far as they are owned by the guilty parties, be confiscated.

ART. 8.—Anyone who wilfully damages or destroys telegraph and telephone works, including cables, in use for public benefit, will be punished with imprisonment from three months to three years.

Anyone who causes such damage as is referred to above, through neglect, may be punished with imprisonment of one day to one month or a fine of 1 florin to 100 florins.

ART. 9.—Deals with the punishment of crimes committed in which telephones are used.

ART. 10.—Libellous, offensive and indecent expressions used over the telephone, will be considered as uttered in public.

ART. 11.—Violation of the secrecy of telegraphs and telephones is punishable in accordance with Arts. 137 and 327 of the existing law.

ART. 12.—Owners of property have to allow, if it is necessary, work to be done on it in connection with the erection of public telegraphs.

ARTS. 13, 14, 15 and 16 deal with the use of private property in the erection of telegraph and telephone lines.

ART. 17.—All precautions should be taken to prevent lightning being conducted along cables or lines.

ART. 18.—The above may be referred to as “Telegraaf- en Telefoon-Verordening 1909,” adding the number of the publication.

ART. 19.—Decrees of 30th October, 1873 (P.B. 1874, No. 1) and of 27th September, 1884 (P.B. 1884, No. 14) as well as P.B. 1982, No. 27, are withdrawn.

ART. 20.—Concessions relating to the erection of telegraphs and telephones on any of the islands of the Colony of Curaçao, granted before this decree comes into force, will be treated as coming under the regulations in force when they were made.

PUBLIC NOTICE.

No. 25 of 1923. (3rd March).

IN THE NAME OF THE QUEEN

THE GOVERNOR OF CURAÇAO,

K In view of the fact that it is desirable to amplify and to modify the Penal Code for the Colony of Curaçao and, in conjunction therewith, the order of 21st September, 1909 (Public Notice No. 52), relating to the installation, exploitation and use of telegraphs and telephones in the Colony of Curaçao, as modified by the Importation Order Penal Code (Public Notice 1918, No. 6);

Has, after obtaining the approval of the Colonial Council, made the following order:—

SECTION I.

ART. 1.—In Section IX of the first book of the Penal Code for the Colony of Curaçao, after article 95 *bis* is inserted a new article 95 *ter*, of the following tenor:—

The term electrical appliances, includes appliances serving to produce, conduct, transform or supply electricity, and the safety, fastening, supporting and alarm devices connected therewith.

Telegraph and telephone appliances are not included in the term electrical appliances.

ART. 2.—After Article 167 of the said Code, are inserted two new articles, of the following tenor :—

ART. 167 *bis*.—Anyone who wilfully destroys, damages or renders unfit for use any electrical appliance, or causes defects in the running or the working of such appliance, or interferes with any safety measures taken in connection with such appliance, will be punished :

1. By imprisonment for a term not exceeding six months or a fine not exceeding three hundred gulden, if stoppage or irregularity of the current supply for the general use is thereby caused ;

2. By imprisonment for a term not exceeding six years, if general prejudice to property is to be apprehended thereby ;

3. By imprisonment for a term not exceeding nine years, if the life of another person is endangered thereby ;

4. By imprisonment for a term not exceeding fifteen years, if the life of another person is endangered thereby and the act results in the death of any person.

ART. 167 *ter*.—Anyone by whose fault it happens that any electrical appliance is destroyed, damaged, or rendered unfit for use, that defects arise in the running or the working of such appliance, or that any safety measures taken in connection with such appliance are interfered with, will be punished :

1. By imprisonment or detention for a term not exceeding three months or a fine not exceeding three hundred gulden, if stoppage or irregularity of the current supply for the general use or general prejudice to property is thereby caused ;

2. By imprisonment or detention for a term not exceeding six months or a fine not exceeding three hundred gulden, if the life of another person is endangered thereby ;

3. By imprisonment or detention for a term not exceeding one year, if the act results in the death of any person.

ART. 3.—In Articles 170 and 171 of the said Code, in place of the words " the traffic by steam power over a railway track," the words " the traffic by mechanical power over a railway track," are to be read.

ART. 4.—In Article 368 of the said Code, in place of the words " railway or telegraph appliances," the words " railway, telegraph, telephone or electrical appliances" are to be read, and the word " electricity" is withdrawn.

ART. 5.—To Article 387 of the said Code, a new second paragraph is added, of the following tenor :

The same penalty will be applicable to the official who, by exceeding his authority, obtains through an official of telephony, or through other persons in charge of the service of a telephone installation for the general use, information about any conversation which has taken place through the medium of the installation.

ART. 6.—After Article 390 of the said Code is inserted a new article, of the following tenor :

ART. 390 *bis*.—Any official of telephony, or any other person entrusted with the supervision or the service of a telephone installation for the general use, who wilfully and unlawfully communicates to another person the substance of a conversation carried on through the medium of telephony or of such installation, will be punished by imprisonment for a term not exceeding one year and six months.

ART. 7.—Article 391 of the said Code is to be read as follows :

Any official of any public establishment of communication or of telegraphy or telephony, or any other person mentioned in Article 390 or Article 390 *bis*, who wilfully allows another to commit any of the acts stated in Articles 388-390 *bis*, or that other is concerned as an accomplice in the same, will be liable to the penalties in their various degrees as laid down by these provisions.

ART. 8.—After Article 460 of the said Code, is inserted a new article, of the following tenor :

ART. 461.—Detention for a term not exceeding three months or a fine not exceeding one thousand gulden will be inflicted upon anyone who either communicates to another the purport of any communication that is received through the medium of a receiving set for wireless telegraphy, or telephony which is under his control or used by him, when he has good reason to suppose that it is not intended for him nor the public, and if he has good reason to suppose that public knowledge of the purport is then bound to follow and such knowledge does in fact follow, or who makes it publicly known.

SECTION 2.

ART. 9.—The order of 21st September, 1909 (Public Notice No. 52), relating to the installation, exploitation and use of telegraphs and telephones in the Colony of Curaçao, as modified by the Importation Order Penal Code (Public Notice 1918, No. 6), receives the following amplifications and modifications :

1. After Article 3, is inserted a new article of the following tenor :

ART. 3 *bis*.—Unless the consent of the Governor is obtained thereto, it is forbidden to install and make use of any transmitting set or receiving set for radio telegraphy or telephony for which no licence has been granted.

With regard to receiving stations for radio-telegraphy or telephony, the necessary consent to the installation and making use of the same will, however, be withheld or revoked only when a state of war or the menace of war gives occasion therefor and when there is good reason to suppose that misuse of the same will be made or is in fact being made.

11. Article 7 is to be read as follows :

Imprisonment for a term not exceeding six months or a fine not exceeding one thousand gulden will be inflicted upon :

1. Any person who installs or uses telegraphs or telephones without the licence required by Article 2 ;

2. Any person who on board of private vessels is guilty of contravention of the prohibition mentioned in Article 3 ;

3. Any person who makes use of a transmitting set or receiving set for radiotelegraphy or telephony for which no licence has been granted, without the consent referred to in Article 3 *bis*.

The telegraph and telephone lines, together with the apparatus used for transmission or reception of telegrams or conversations, may, in so far as they belong to the offender, be confiscated.

SECTION 3.

ART. 10.—This order comes into force on the day following that of its publication.

Given at Willemstad, March 3rd, 1923.

BRANTJES.

The Secretary of State,

Published on June 4th, 1923.

BOOMGAART.

The Secretary of State,

BOOMGAART.

REGULATIONS FOR TELEGRAPH SERVICE IN THE DUTCH EAST INDIES.

6th October, 1876.

L The old regulations issued by decree of 31st March, 1858, concerning the electro-magnetic telegraphs should now be superseded and new regulations as hereunder be brought into force.

Regulations concerning the erection and use of telegraphs in the Dutch East Indies.

ART. 1.—No telegraphs may be erected or used without permission of the Government, except those exclusively owned and used privately.

ART. 2.—The conditions for permission to erect such telegraphs will be fixed in each case separately.

ART. 3.—The Governor-General has the right to take possession of all telegraphs or to stop their exploitation.

ART. 4.—If telegraphs are erected without permission open for public traffic, a fine of from 200 florins to 1,000 florins can be inflicted.

ART. 5.—Owners of property have to allow, if it is necessary, work to be done on it in connection with the erection of public telegraphs.

ART. 6.—They should give access to officials and not interfere with the work done and the lines erected.

ART. 7.—If they refuse access they will be fined from 25 florins to 100 florins.

ART. 8.—They have a right to compensation or damage done to their property.

ART. 9.—Everybody has a right to have telegrams sent under the conditions laid down in the service regulations.

ART. 10.—The State or the Telegraph Company is not responsible for the transmission of telegrams in general or within a certain time.

ART. 11.—Punishment for embezzlement or opening of telegrams, communication of their contents to outsiders, etc., will be inflicted in accordance with the existing laws.

ART. 11a.—Telegrams, the contents of which are of danger to the State, or in conflict with the law, or of an obscene character, will not be accepted or delivered.

ART. 12.—Punishment in accordance with the existing laws is to be inflicted on every official who falsifies telegrams and on those who knowingly profit by the misuse of such telegrams.

ART. 13.—Damage to telegraph works or material is punishable with imprisonment and penal servitude.

ART. 14.—The Head of the Local Council may order, on request of the Chief of the Telegraph Service, the removal of everything impeding the efficiency of that service.

The above was published in the *Official Gazette (Staatsblad)* of the Dutch East Indies, and the regulations also apply to Telegraphs or Telephones, whereby the apparatus at both ends is not connected with wires or conductors (Decree of 7th December, 1903. *Staatsblad*, No. 405, Supplemented by Decree of 8th September 1906. *Staatsblad*, No. 403).

HONG-KONG

(See Maps 17 and 20).

HONG-KONG is administered as a Crown Colony under a Governor, aided by an Executive Council of nine members, and a Legislative Council of thirteen.

CONTROL AND ORGANISATION.

Hong-Kong possesses four radio stations. Stonecutters Naval Radio Station is used almost entirely for naval purposes, but also transmits time signals for the Royal Hong-Kong Observatory; Cape D'Aguilar Radio Station used for any purpose, *i.e.*, naval, Government, commercial, but primarily for the public service; a small station, $\frac{1}{2}$ -kW. Marconi type, set on Gap Rock, used for communication between the Rock and mainland when necessary; and a direction finding station.

The following additional wireless sets are being installed:—a 6 kW. valve set at D'Aguilar, a $1\frac{1}{2}$ kW. valve set and a $\frac{1}{4}$ kW. quenched spark set for the G.P.O. station, a $\frac{1}{4}$ kW. quenched spark set at Waglan Lighthouse and 20 watt telephony sets for the Water Police Station and on Cheung Chan Island.

A receiving installation is fitted in the Royal Observatory, and is used for the reception of time signals from other observatories.

Weather reports are issued daily from the Royal Observatory, and transmitted by the Cape D'Aguilar station at the following hours—G.M.T. 0500, 0900, 1200—on a wavelength of 600 metres.

Typhoon warnings are transmitted by this station on receipt from Royal Observatory, and repeated at each even hour, *i.e.*, noon, 2 p.m., etc.

Navigation warnings are transmitted on receipt from harbour master, and repeated after daily weather report.

Navigation warnings received from ships are immediately broadcast by this station, and repeated after daily weather report.

Time signals are transmitted twice daily by Stonecutters (naval station), commencing at 0156 G.M.T. until 0200 G.M.T., and from 1256 G.M.T. until 1300 G.M.T., on a wavelength of 2,000 metres.

Gap Rock, when required, or during typhoon, forwards hourly observations to Royal Observatory via Cape D'Aguiar.

The direction finding station gives bearings on a wavelength of 800 metres normally, but ships not fitted to transmit on this wave may request bearings on a 450 or 300 metre wavelength by arrangement with Cape D'Aguiar "V.P.S." on a 600 metre wave.

Hong-Kong time is eight hours ahead of G.M.T.

No licences have yet been issued for amateur stations, but the Hong-Kong Amateur Radio Society has, with the permission of the Government, been recently formed.

Two schools for training Chinese operators have been opened.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. H. T. Creasy ..	Director of Public Works	P.W.D. Hong-Kong
Mr. L. H. King ..	Executive Engineer	P.W.D. Hong-Kong

ADMINISTRATION.

The regulation of wireless telegraphy is carried on under the provisions of the Wireless Telegraphy Ordinance, 1913, passed on July 25th of that year, which repealed all previous Ordinances; and by regulations issued under that Ordinance.

A—The Wireless Telegraphy Ordinance, 1913.

B—Regulations.

C—Ship Licence.

D—Permit to use wireless telegraphy on ships in the harbours of the Colony.

ORDINANCE No. 20 OF 1913.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. "Telegraph" means an electric, galvanic or magnetic telegraph and includes appliances and apparatus for transmitting or making telegraphic, telephonic or other communications by means of electricity, galvanism or magnetism.

The expression "Wireless Telegraphy" means any system of communication by "telegraph" as (defined in this Ordinance) without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: provided that nothing in this Ordinance shall prevent any person from making or using an electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may whenever he shall deem it expedient to do so licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the colony or on board any British ship registered in the colony.

4. (i) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the colony or on board any British ship registered in the colony except under and in accordance with a licence granted in that behalf by the Governor.

(ii) Every such licence shall be in such form and for such period as the Governor-in-Council may determine and shall contain such terms, conditions, and restrictions on and subject to which the licence is granted

as the Governor shall consider desirable in the public interest.

5. (i) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Attorney-General.

(ii) If a magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (i) The Governor-in-Council may make regulations for all or any of the following matters:—

(a) For prescribing the form and manner in which applications for licences under this Ordinance are to be made;

(b) For prescribing the fees payable on the grant of any licence;

(c) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British

or foreign, in the waters of the colony shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in the colony or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) For prohibiting, except with the special or general permission of the Colonial Secretary, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the colony;

(e) For prohibiting or regulating, in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the colony, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(ii) Provided that no regulations made in respect of the matters described in paragraphs (c), (d), and (e) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the Governor that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy a licence for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

8. (i) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine of five hundred dollars.

(ii) All convictions, forfeitures, and fines under this Ordinance or any regulations made thereunder may be had and recovered before a magistrate.

9. The Wireless Telegraphy Ordinance, 1903, the Wireless Telegraphy Ordinance, 1909, and the Wireless Telegraphy Amendment Ordinance, 1909, are hereby repealed.

B REGULATIONS made by the officer Administering the Government in Council under the provisions of Section 6 of the Wireless Telegraphy Ordinance No. 20 of 1913, on November 20th, 1913:—

1. Any person desirous of obtaining a licence for the establishment of a wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the colony, or on board any British ship registered in the colony, must apply in writing

to the Colonial Secretary. Such application must contain full particulars—

(a) Of the place or ship in respect of which a licence is sought;

(b) Of the nature of the apparatus which it is desired and proposed to install and work and

(c) Of the purposes for which the installation is intended to be utilised.

2. The following shall be the fees payable on the grant of licences:—

(a) For a licence under Section 3 for a land station \$2.50

(b) For a licence under Section 3 for a ship station \$2.50

(c) For an experimental licence under Section 7 Nil

3. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the colony shall be worked in such a way as not to interfere with—

(a) Naval signalling; or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the colony except with the special or general permission in writing of the Colonial Secretary of the colony.

5. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that his Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. No proceedings shall be taken against any person under these regulations except with the previous sanction of the Attorney-General.

REGULATIONS MADE BY THE GOVERNOR IN COUNCIL UNDER SECTION 4 (2) AND SECTION 6 OF THE WIRELESS TELEGRAPHY ORDINANCE, 1913, ORDINANCE No. 20 OF 1913, THIS 24TH DAY OF FEBRUARY, 1921.

Published in the Government Gazette of the 4th March, 1921, Government Notification No. 78.

1. The licence required under the Wireless Telegraphy Ordinance, 1913, Ordinance No. 20 of 1913, for the establishment of a wireless telegraph station or the installation or working of any apparatus for wireless telegraphy on board any British Ship registered in the Colony of Hong-Kong shall be in the form set out in first schedule hereto.

2. The special or general permission of the Colonial Secretary required under Regulation 4 of the Wireless Telegraphy Regulations published on pages 906 and 907 of the "Regulations

of Hong-Kong, 1914," shall be in the form set out in the second schedule hereto and the fee for such permission shall be two dollars.

3. The forms of licence and permit prescribed in Government Notification No. 353 published in the *Gazette* on the 6th day of August, 1915, are hereby repealed.

S. B. B. McELDERRY,
Clerk of Councils.

COUNCIL CHAMBER,
24th February, 1921.

FIRST SCHEDULE.

SHIPS.

Dated the day of , 19
THE WIRELESS TELEGRAPHY ORDINANCE, 1913.
(HONG-KONG.)

His Excellency the Governor of the Colony of Hong-Kong
To

LICENCE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATIONS.

To all to whom these presents shall come I

Governor and Commander-in-Chief of the Colony of Hong-Kong and its Dependencies and Vice-Admiral of the same send greeting :

Whereas
of
(hereinafter called "the licensee") is desirous of establishing installing working and using on a ship or ships belonging to the licensee Wireless Telegraphy as defined in Section 2 of the Wireless Telegraphy Ordinance, 1913 :

And whereas by reason of the provisions of the Wireless Telegraphy Ordinance, 1913, it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor :

And whereas at the request of the licensee I have agreed to grant to the licensee the licenses, powers and authorities hereinafter expressed and contained for the period upon the terms and subject to the stipulations and conditions hereinafter appearing :

Now I the above named

Governor and Commander-in-Chief of the Colony of Hong-Kong and its Dependencies and Vice-Admiral of the same in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee from the date hereof so long as the Wireless Telegraphy Ordinance, 1913, shall continue in force unless and until these presents and the licence or permission hereby given shall be determined as hereinafter provided licence and permission—

(i) To establish, install and work for the purposes hereinafter mentioned at the ship station or stations specified in the Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedule hereto (which apparatus is hereinafter referred to as "the licensed apparatus") :

Provided that—

(a) Each ship station shall be of such class mentioned in Article XIII of the Service Regulations annexed to Radiotelegraph Convention, 1912, as is specified in the said Schedule opposite to the name of such station ;

(b) The apparatus installed at each ship station shall be of the character specified in the said schedule opposite to the name of such station ;

(c) The sending apparatus used at each ship station shall be of such a character that the waves emitted are as pure and as little damped as possible and the receiving apparatus used at the said station or stations shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals ;

(d) The apparatus shall include such emergency installation as may be required according to the class of the ship station under the provisions of Article XI of the Service Regulations annexed to the Radiotelegraph Convention, 1912 ;

(e) The licensed apparatus shall be so constructed as to be capable of using wavelengths of 600 and 300 metres in length as measured by the standard of measurement in use by the Government of the Colony for the time being or as may be otherwise directed by the Governor and such other wavelengths not exceeding 600 metres in length as shall be authorised in writing from time to time by the Governor ; Provided always that the wavelength of 600 metres shall normally be used for communication and further that the wavelength of 1,800 metres may be used in the exceptional case contemplated by Article XXXV (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention, 1912 ; Provided further that only the wavelength of 600 metres shall be used by the licensee during the period of any war in which the United Kingdom is engaged ;

(f) The apparatus shall admit of the transmission and reception of messages at the rate of not less than 20 words a minute five letters being counted as one word.

(g) Each ship shall be provided with two certified operators together with suitable accommodation for the apparatus and operators and a wireless service shall be maintained at all times during the period of this licence.

(ii) To send and receive messages by means of the licensed apparatus between the said ship stations, and also between the said ship stations and coast stations and other ship stations.

Provided that the licensee shall not except with the consent in writing of the Colonial Secretary of the Colony send or receive messages from and at the said ship stations when in any of the harbours of the Colony ; and

(iii) To receive money or other valuable consideration for or in respect of the use of the license apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions :—

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there shall be something either in the subject or context repugnant to such construction (that is to say) :—

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The term "telegraph" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The expression "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether a coast station or a ship station.

The expression "the Admiralty" means the officer of His Majesty's Navy who is for the time being in Hong-Kong in charge of the China Squadron of His Majesty's Eastern Fleet.

The expressions "the International Telegraph Convention" and "the International Telegraph Regulations" mean respectively the International Convention of St. Petersburg dated the 10th/22nd July, 1875, and the Service Regulations made thereunder, and include respectively any modifications of the Convention or regulations made from time to time.

The expression "the Radiotelegraph Convention, 1912," means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which has been established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf of or by permission of the licensee for the despatch or receipt of messages except messages authorised by this licence.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(2) If the Admiralty is of opinion that the working of the licensed apparatus at any ship station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall, when required in writing by the Governor so to do close the said station.

(3) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Wireless Telegraphy Ordinance, 1913, by the Governor in Council in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Governor from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not without the consent of the Governor be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

9. The licensee shall at all times indemnify the Governor against all actions, claims and demands, which may be brought or made by any corporation, company, or person in respect of any injury arising from any act licensed or permitted by these presents.

10. (1) Subject to the provisions of this licence the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge, order of transmission or otherwise. Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

Clauses 11 to 24 are practically identical with Clauses 13 to 26 of the Form of Ship Licence in force in Great Britain, (see page 219), with the following exceptions:—

Where the words "POSTMASTER-GENERAL" occur in the British licence, the words "THE GOVERNOR" or "THE COLONIAL TREASURER" (where the payment of fees is in question) are substituted.

Also Clause 17 of the Hong Kong licence (which corresponds to Clause 19 of the British licence) reads as follows:—

17. The licensee shall carry on every ship on which a ship station is established under this licence, a print or copy of the licence certified under the hand of the Colonial Secretary of the Colony of Hong-Kong or appropriate officer of the Postmaster-General of the United Kingdom or of the Government of any self-governing Dominion to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls. The licensee shall also carry on every such ship such documents as may be prescribed by the Governor for the purpose of enabling the licensee to communicate with coast stations and ship stations in accordance with the Radiotelegraph Convention, 1912.

Clause 18 (corresponding to Clause 20 of the British licence) also reads as follows:—

18. (1) The licensee shall pay to the Colonial Treasurer for and in respect of the licence hereby granted a royalty of \$25 per annum in respect of each ship station at which the licensed apparatus is installed.

(2) The said royalty shall be payable on the 1st of December in each year during which the licence remains valid.

Clause 24 (corresponding to Clause 26 of the British Licence), reads:—

to the master of the ship upon which such station is installed and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Colonial Secretary of the Colony of Hong-Kong.

As Witness my hand and seal this.....
 day of.....One thousand
 nine hundred and.....

Name of Ship on which Station established.	Class of Ship Station under the Radiotelegraphic Convention, 1912.	Nature of Services Performed.	Hours of Service.	Normal Range of Signalling in Nautical Miles.		Character of Apparatus.		Power.		If Alternator is used, Number of Cycles per Second.
				By Night.	By Day.	System of Radiotelegraphy with the Characteristics of the System of Emission.	Wave-lengths (in Metres).	Source and Maximum Output.	Maximum to be taken in Sending Instruments.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

Audit No. _____ G. R.
PERMIT TO WORK AND USE APPARATUS
FOR WIRELESS TELEGRAPHY ON BOARD A
MERCHANT SHIP IN THE HARBOURS OF THE
COLONY

D Section 6 (1) (iv).

Permission is hereby given for the working and using of apparatus for wireless telegraphy on board the ships of the specified in the Schedule hereto whilst such ships are in any of the harbours of the Colony subject nevertheless to the following conditions, namely:—

1. This permit may be cancelled or suspended at any time by the Governor in his absolute discretion and without any reason being assigned therefor.

2. All such vessels shall obey promptly the "naval silence sign" (●●●●●●●●●●) and thereupon shall not work or use their wireless telegraphy apparatus until after the "Message Complete Sign" (●●●●●●●●●●) shall have been made.

3. The above company shall render every assistance possible as required by the Postmaster-General by furnishing information in respect of incoming mails carried by the ships of the said company.

4. All information received as to the weather being experienced by the vessels of the said company at sea must be forwarded to the Harbour Office for transmission to the observatory or sent to the observatory direct whichever may be the more expeditious. The information should give the date and time of the observation, the position of the ship, the reading of the barometer, the direction and force of the wind, and the state of the sea and weather.

Dated at Hong-Kong, this day of

19 .
• Fee \$2 received

Colonial Secretary.

SCHEDULE.

Colonial Secretary.

HONDURAS

(See Maps 35, 43 and 44.)

Including : Swan Island.

HONDURAS is a Republic, proclaimed September 15th, 1821, and is governed under a charter proclaimed October, 1894. The Legislative Power is in the hands of a Congress of Deputies. The executive authority

rests with the President, nominated and elected by popular vote for four years. The Republic is administered by a Council of six ministers.

Swan Island is situated in the Caribbean Sea, some 90 miles North-west of Honduras. It has no harbour and is difficult to approach in all but calm weather.

CONTROL AND ORGANISATION.

The present stations belong to private companies, and are without any co-ordination, being used only by the various companies to maintain communication with their own steamers. Under favourable atmospheric conditions they can work with New Orleans, but ordinarily they communicate with the Isla del Cisne (Swan Island), in the Caribbean Sea. They are more or less of the type of that at Tela, which has a transmitter of 5 kW., and aerials sustained by towers 250 feet high.

The Government has ordered a course of wireless to be included in the studies of the Ministry School at Tegucigalpa, and has installed an instructional set.

The owners of Radiotelegraphic stations situate on Swan Island are the United Fruit Co., who have there a relay station between New Orleans and Burrwood La., and their plantations in Columbia, Panama, Nicaragua, and the Gulf. This station on Swan Island was entirely re-equipped in 1912 by the Marconi Wireless Telegraph Company of Canada.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address</i>
Excmo. Señor don Jesus M. Alvarado	Secretario de Estado en el Despacho de Fomento, Obras Públicas y Agricultura	Tegucigalpa
Licenciado don Antonio Castillo Vega	Sub-Secretario de Estado en el Despacho de Fomento, Obras Públicas y Agricultura	Tegucigalpa

ADMINISTRATION.

According to the Law of Telegraphs of the Republic, this branch of Telegraphy is the exclusive right of the State, but this right has been made over to private companies on the north coast in the form of concessions.

A Decree of July 16th, 1920, declares the necessity of providing a modern and effective service of communication to aid international and official relations and to provide a news service.

To this end the sum of two hundred and fifty thousand colones has been voted for the purchase and installation of a radiotelegraphic and radiotelephonic station, situated preferably at the capital of the Republic, of sufficient power to communicate with places where radiotelegraph, radiotelephone, cablegraph or telegraph stations may be open for public service. Also from this same sum a number of smaller stations in the scattered regions of the National territory and preferably in the Cantons of Osa, Puntarenas, Liberia, and Sixaola are to be provided.

The following are the conditions under which private companies are granted concessions to install and work radiotelegraphic and radiotelephonic apparatus :—

“The concessionaire has the right to construct, maintain and use wireless stations in order to direct the service of his steamships and those chartered by him. Such stations must not be used for public service without previous arrangement with the Government. The Government shall have the right in times of peace or war to use such installations, without remuneration for the concessionaire, and even to direct and exclusively control the service of same, by its own employees.”

These concessions granted by the Government were approved by Congress.

HUNGARY

(See Maps 8, 13 and 14.)

THE Kingdom of Hungary, pending the election of a King, is governed by a Regent appointed by the National Assembly.

CONTROL.

Radiotelegraphy is at present controlled by the Director-General of Posts and Telegraphs who is responsible for the promulgation of all laws and regulations relative thereto.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Mons. Charles Demény	Secretary of State and Director-General of Posts and Telegraphs	Budapest

ORGANISATION.

A large station, with a range of 3,000 km., situated at Csepel, near Budapest was established on November 18th, 1914, and during the year 1921 was equipped with a 5-kW. valve C.W. transmission set. This has been augmented by a special station to receive news, etc., from Nauen.

A new station was opened in January, 1924, at Székesfehérvár, with a receiving station at Tárnok, equipped with 10 kW. valves and 50 kW. alternator.

These stations are operated by the Central Telegraph Office at Budapest.

Considerable radiotelegraphic and telephonic developments are in course of development. Wireless apparatus has been installed in many of the schools throughout the country. A new 1-kW. station was open in 1923 at the Aerodrome in Matyasfold, near Budapest, for communication with airships and the transmission of meteorological reports on a wavelength of 900 metres C.W.

ADMINISTRATION.

A law concerning aviation in connection with radiotelegraphy is in course of preparation, but detailed particulars are not yet available.

Radiotelegraphy is governed by the following Decrees and Regulations.

A—Decree No. 62574/13, dated October 16th, 1913.

B—Form of ship Licence thereunder.

C—Form of Certificate for Ship Stations.

D—Form of Certificate for Operators.

E—Form of Licence for Private Receiving Station.

F—Decree No. 85463/1924, dated September 13th, 1924.

DECREE OF THE HUNGARIAN MINISTER OF COMMERCE WITH REFERENCE TO THE FITTING UP OF WIRELESS STATIONS ON HUNGARIAN SEA-GOING PASSENGER SHIPS.

A In accordance with paragraphs 24 and 27 of the Supplement to my Order No. 60,805, issued on August 21st of the current year, in the matter of authorising the placing of service of commercial sea-going ships, the safety appliances provided on them and the provision of the navigation service in connection with working them, passenger lines already in service, which make regular voyages from Hungarian ports to points beyond Gibraltar or Aden and are carrying passengers, are to be fitted with wireless apparatus of the description specified below not later than by February 1st, 1915; new ships, on the other hand, must be fitted with such apparatus before they are put into service. Such apparatus must be sufficiently

powerful to be able to send or receive messages under ordinary conditions over a minimum distance of 100 sea miles.

In order to carry out this decree I order the following:—

1. The owner (or charterer) is obliged to apply to the Hungarian Minister of Commerce for permission to establish a wireless station on board.

Such application must be accompanied in quadruplicate by a technical description of the apparatus to be used, with a diagram of the connections. Any subsequent alteration in the system, or remodelling of any description of the apparatus, which may affect its capacity for sending or receiving messages, must receive the preliminary authorisation of the Hungarian Minister of Commerce.

2. The arrangement of the wireless station on the ship must be up to date and comply with Rule 3 of the London International Wireless Agreement, so that the station may be able to work in harmony with the working of

wireless stations using other systems and be able to exchange messages with such other stations. The system to be adopted and to be used will depend on the preliminary authorisation of the Hungarian Minister of Commerce.

The apparatus must be of such a type that it can be adjusted for waves 300 and 600 metres long and with these be able to send or receive 20 words at least per minute, counting five letters to the word.

In the case of applying subsections 2a to 2d of paragraph xxxv of the London International Wireless Service Regulations, the apparatus on the ship will be allowed to make use also of wavelengths of 1,800 metres.

3. All the machinery and materials for fitting up the wireless station on the ship must be acquired in the home country as far as possible.

Machinery and materials to be used for such purpose may only be acquired from abroad with the special permission of the Hungarian Minister of Commerce. Service books and similar other stores and office requisites for the working of the wireless service will be supplied at cost price by the Chief Post and Telegraph Administration.

4. All ships fitted either for continuous or restricted wireless service must, in addition to the usual apparatus be fitted also with apparatus for sending out wireless distress signals in conformity with Rule xi of the London Wireless Service Regulations as ordered by and in a manner fixed by the Hungarian Minister of Commerce.

Such apparatus for sending out wireless distress signals must be provided with its own separate power supply independently of any other power supply not used for the wireless service on board and must be of a design that it can be put in action expeditiously and be kept at work continuously for at least six hours and at the same time be powerful enough to send signals over a distance of at least 80 sea miles, on ships having a continuous wireless service and over at least 50 miles on ships with restricted wireless service.

This special installation for sending out distress signals may be omitted on all ships on which the regular wireless installation is able to fulfil these requirements.

5. The speed at which signals can be sent and received will be set out by the Hungarian Minister of Commerce in the document granting permission to establish a wireless service on a ship.

As regards new inventions for materially improving the efficient working of the apparatus and the speed of sending and receiving messages, the Hungarian Minister of Commerce may compel the owner (or charterer) of the ship to adopt such invention or inventions within a fixed period for the wireless station on his ship with due regard to existing practical requirements and a fair consideration of the expenditure incurred in connection therewith.

6. Under ordinary conditions the electrical power for working the wireless apparatus may not exceed one kilowatt. A greater power than this may only be used if the nearest station on the coast with which it is desired to exchange messages is situated at a greater distance than 200 sea miles or if on account of obstacles extant it is necessary to use the larger power (London Wireless Service Regulations, Rule viii).

7. The Chief Post and Telegraph Administration is empowered to have the wireless installation examined by its own inspectors at any period and to control the service.

The owner (or charterer) of the ship is obliged to afford to the inspectors of the Chief Post and Telegraph Administration, and with the intervention of this Administration to officers appointed by the Navy every facility to make themselves thoroughly familiar with the working in every detail of the wireless apparatus and gear and to acquire the necessary practice in working the apparatus.

Any stipulation on the part of the supplier of the apparatus that certain parts or details of the apparatus are to be kept secret and not to be shown to the inspectors of the Chief Post and Telegraph Administration or to officers of the Navy must not be accepted by the owner (or charterer) of the ship.

All inspectors and naval officers deputed to control or learn the working of the apparatus must be carried on the ship cost free by the owner (or charterer) of the ship in a class corresponding to their rank (with cabin accommodation in accordance therewith also free) and to charge them for their board at cost price.

Not more than two such persons, however, may travel on these conditions on the same voyage.

8. The nature of the service of the wireless station on the ship (whether public or special service, etc.), and its duration (whether continuous, restricted or service without special fixed hours), also the number and qualification (1st class or 2nd class) of the wireless operators, will be set out by the Hungarian Minister of Commerce in the document granting permission for the installation.

9. The Hungarian Minister of Commerce reserves himself the right to suspend at any time the wireless service on the ship for an indefinite period or permanently or in respect of certain special classes of messages without divulging his reason for so doing or without rendering himself liable to the payment of an indemnity.

In the case of an order for mobilisation in the Hungarian Monarchy being issued or in the case of war the wireless service on the ship is to be suspended altogether unless the captain of the ship receives special instructions to the contrary from the Chief Post and Telegraph Administration.

The captain of the ship will be held personally responsible for the carrying out of this regulation.

In other respects in time of mobilisation or war the owner (or charterer) of the ship is bound to carry out the special orders to be issued for the occasion.

10. Wireless operators to be employed may only be Hungarian citizens with a blameless record who can speak and write the Magyar language thoroughly and have obtained a certificate of qualification as regards wireless operating from the examining committee appointed by the Hungarian Minister of Commerce for the purpose.

The individuals thus qualified are to take the oath of loyalty in the presence of the examining committee, such oath to include promises to attend to their duty and to keep all messages secret, the fact of their having taken the oath being recorded on their certificate of qualification.

The wireless operators on board are subject to the discipline on the ship, must each possess their service books, and are to be placed on the list of the crew.

The owner (or charterer) of the ship is only allowed to have such individuals trained for the wireless service who have been chosen by

the Hungarian Chief Post and Telegraph Administration for such purpose from a preliminary list of candidates submitted to the Administration.

Every wireless operator whose certificate is cancelled by the Hungarian Post and Telegraph Administration is to be dismissed immediately.

The owner (or charterer) of the ship is bound to give immediate notice of any change in the personnel of wireless operators to the Chief Post and Telegraph Administration and to the Hungarian Naval Authorities.

11. Every wireless station established for public service may be used by the public for sending wireless messages against payment of the proper fees.

The tariff of fees for wireless messages is fixed by the Hungarian Minister of Commerce on the recommendation of the Company. These fees are retained by the owner of the wireless station on board.

12. Out of these fees received by the owner (or charterer) of the ship for wireless messages he is responsible for the portions due to the inland and foreign telegraph authorities for forwarding messages.

In administrative matters the owner (or charterer) of the ship, or the wireless station on board may only communicate with foreign telegraph administrations or with the International Bureau at Berne of the Telegraph Association through the Hungarian Chief Post and Telegraph Administration.

13. In conformity with Rule 3 of the London Wireless Agreement the wireless station on board is bound to enter into communication with every wireless station ashore or established on any ships regardless of the system used by such stations for the purpose of exchanging messages, and in accordance with Rule 9 the wireless station on board is compelled to accept distress signals from any source whatever, to reply to these and to take the necessary steps.

Wireless stations established on ships are to pay particular attention to the working of stations on the coast. The wireless station on board is to be kept in perpetual and efficient working order in order to be able to keep up faultless communication with the coastal stations.

At the request of the coastal station the wireless station on board is bound to stop its message immediately.

14. The working of the wireless station on board and the accounting for the fees received by such station are to be governed by the London Wireless Agreement and the service regulations attached thereto, by the St. Petersburg Telegraph Agreement and the service regulations attached thereto, and also by any orders already issued or to be issued by the Hungarian Chief Post and Telegraph Administration.

The wireless station, or the shipowner (or charterer) respectively, is bound to conform with the legal enactments and orders issued with reference to matters relating to the telegraph, telephone and electric signals.

During a stay in foreign ports the wireless station on board is bound to conform with any special rules which may be in force in the country of its sojourn besides those prescribed by the International Wireless Agreement and the regulations attached thereto.

It is the duty of the shipowner (or charterer) to make himself acquainted with these.

15. As an acknowledgment of the sovereignty of the State and in order to defray expenses

incurred in the ordinary control of the wireless station on board, the owner (or charterer) of the ship is bound to pay on the dates named, and at the receiving offices named in the document granting permission for the establishment of the wireless station, twenty (20) crowns per station per annum.

Should it become necessary to institute an inquiry owing to any neglect or fault on the part of the owner (or charterer) of the ship or one of his employees and should the inquiry establish any neglect or fault on the part of the owner (or charterer) or one of his employees, the owner (or charterer) will be bound to indemnify the Treasury for all expenses incurred in connection with such enquiry.

16. In every case of neglect or fault in or about the wireless service the Hungarian Chief Post and Telegraph Administration may mulct the owner (or charterer) of the ship in a penalty not exceeding 100 crowns providing such acts of neglect or fault do not constitute a misdemeanour or crime.

17. If after repeated warnings the wireless station on board should not do its duty, or if the working of the station should militate against public interests, the Hungarian Minister of Commerce is empowered to inflict a heavier penalty of 100 to 1,000 crowns or to issue orders to have the working of the wireless station entrusted to an individual appointed by the Minister at the expense and responsibility of the shipping undertaking, and at the same time the Minister is to have power to have all faults made good in the apparatus and have all the necessary alterations made in the apparatus at the expense of the owner (or charterer) of the ship, or as an alternative to suspend or cancel the permit for the wireless station on board.

18. The permit for the establishment and working of a wireless station on board cannot be granted for a period exceeding 20 years.

At the expiration of the period mentioned in the document granting permission the whole installation with all its accessories (including furniture and fittings) and eventually also the installation for sending out distress signals are to be handed over to the Hungarian Post Office in full efficient and faultless working condition free of charge and without liability.

Should the Hungarian Post Office not wish to take charge of the working of such wireless station thus come into their possession, but to leave it further in the hands of the owner (or charterer) of the ship, the owner (or charterer) is bound to pay twenty (20) crowns per annum over and above the fee mentioned in Clause 15 in acknowledgment of the right of ownership of the installation thus acquired by the State.

A permit given for the establishment of a wireless station on a ship is automatically cancelled by the putting out of commission of the ship and the owner (or charterer) of the ship is obliged to give notice of this to the Hungarian Chief Post and Telegraph Administration. Should it be desired to transfer the wireless installation to another ship a fresh permit for so doing will be required.

19. Moreover, the Hungarian Minister of Commerce has full power to cancel temporarily or permanently the permit for the working of a wireless station at any time even before the expiry of the period for which such permit has been granted and to cancel it without assigning any reason for his decision and to take over the working of the installation or to have it dismantled.

In the case of the working of the installation being taken over temporarily by the Ministry, the owner (or charterer) of the ship is bound to hand over for use free of charge and without any indemnity the whole of the installation with all the apparatus, fittings and stores for working same, also the cabin and locality in which the installation is housed, together with the sleeping cabins of the wireless operators; also to supply free of cost the power required for working the installation and supply the food, render all medical service and provide attendance and other necessities required by the operators. As against this, however, all fees paid for wireless messages will be handed over to the owner (or charterer) of the ship.

The terms of the final taking over of the installation are or will be specified in the permit or in the special order issued for the purpose.

Before the installation is taken over finally under the ordinary conditions six months, previous notice will be given, but the Hungarian Minister of Commerce reserves himself the right to shorten the period if public interests should necessitate this step or even to take over the installation at any time without any previous notice whatever.

20. Should, in the unchallengeable opinion of the Hungarian Minister of Commerce, public interests require it, the Hungarian Chief Post and Telegraph Administration may—through the courts of law and without incurring any liability in respect of claims for indemnity—issue orders for any vessel being fitted with wireless installation at the expense of the Treasury to have the service maintained and to have the installation dismantled when its use is no longer required by public interests and to arrange for certain compensation being arranged in connection therewith to the owner (or charterer) of the vessel.

21. The Hungarian Minister of Commerce reserves himself the right to grant exemptions from the above regulations from case to case in conformity with practical requirements.

Hungarian Minister of Commerce.

N.....

V. 191.

SHIP LICENCE.

B SEC. 1.—The Minister grants a licence to install a public wireless service station on his ship named carrying passengers and to work such station during the period while the licence remains in force under the conditions specified below.

SEC. 2.—The person to whom the licence is granted is obliged to comply with the following:—

(a) With the provisions contained in Section XXXI of the Law of 1888 and with Decree No. 23445 issued in July, 1890, for carrying out this law, as well as with Decree No. 62574 issued on October 16th, 1913, for establishing wireless stations on Hungarian passenger ships.

(b) With the provisions of any law to be enacted in future as well as of any ministerial decree or order already issued or to be issued in future by the Hungarian Post Office with the same object in view.

(c) With the orders contained in the International Wireless Agreement and its service regulations.

(d) With the conditions laid down in the present licence.

SEC. 3.—The grantee is obliged to establish the installation on board in accordance with the "Telefunken" system in a manner complying in every respect with the requirements laid down in the Wireless Service Regulations, Rule III, sub-sections 1 and 2, Rule VII, sub-section 2 and Rule VIII.

The normal distance over which the installation is to be able to exchange messages is to be at least 200 sea miles by day and at least 300 miles by night.

The normal wavelength of the installation is fixed by the Minister at 600 metres with the reservation laid down in Rules III and XXXV of the International Wireless Service Regulations.

SEC. 4.—The holder of this licence is obliged to install besides the ordinary service installation on board an auxiliary installation in conformity with Rule XI of the International Wireless Service Regulations.

SEC. 5.—The holder of this licence undertakes to maintain permanently the two installations mentioned in sections 3 and 4 in good serviceable working condition and to introduce all improvements in accordance with the progress made by the science of wireless telegraphy.

The Minister reserves himself the right to compel the holder of this licence to adopt all new inventions of wireless practice materially enhancing the reliability and speed of exchanging messages.

All machinery, apparatus and materials to be used in fitting up the installation on board are to be obtained inland as far as possible.

Machinery, materials and apparatus of this kind may only be obtained from abroad with the special sanction of the Hungarian Minister of Commerce.

SEC. 6.—The holder of this licence has no right to alter the system of the wireless installation on board mentioned in Section 3. Generally speaking the Minister's preliminary consent must be obtained for any alteration whatever in the installation as described in the technical description or in the diagram of connections both forming a complementary part of the present licence.

SEC. 7.—The holder of this licence and his employee in handling the wireless apparatus and maintaining the wireless service must act in conformity with the International Wireless Agreement and the Service Regulations attached thereto with the rate of telegraph fees and also with Parts I and II of the telegraph service rules and orders issued by the Chief Post and Telegraph Administration.

SEC. 8.—The Minister fixes the call signal of the station in the H.A.B. group of letters, its character is to be a "PG station for public correspondence" in conformity with sub-section 4 of Rule V of the Wireless Service Regulations. As regards hours of service the wireless station is to be classed in the second category—i.e., stations with restricted hours of service in accordance with the provisions of Rule XIII, sub-section 3 of the Wireless Service Regulations.

The official hours are to be from 8 a.m. to 8 p.m.

In accordance with Rule XIII sub-section 3 of the International Wireless Service Regulations—during the periods of sailing over and above the official hours named—operators must be at their posts ready to receive messages and stay there permanently during the first ten minutes of every hour.

SEC. 9.—In conformity with the office hours fixed in section 8 the holder of this licence

undertakes to employ at least one first-class operator for attending to the service of the wireless station on board in accordance with Rule X sub-section 2 and the Wireless Service Regulations.

SEC. 10.—This operator, like all other wireless employees, must be a Hungarian citizen of blameless character who is able to write and speak the Magyar language perfectly and is the holder of a certificate of qualification for wireless operating from an examining body appointed for the purpose by the Hungarian Minister of Commerce.

The qualified individuals must take the oath of loyalty in the presence of the examining body, such oath to include promises of due attendance to their duties and to keep all messages secret, the fact of having taken this oath is to be testified in their certificate of qualification.

The employees in the service of the wireless station on board are subject to the discipline of the ship, they must be provided with service books of the ship and enrolled on the register of the crew.

As regards the wireless service these employees are subject also to the Chief Post and Telegraph Administration and must comply with the directions issued for the proper performance of the service.

The owner (charterer) of the ship may only train such individuals for the wireless service whose training is permitted by the Hungarian Chief Post and Telegraph Administration after preliminary notice of such intended training has been given to the Administration.

Every wireless employee whose certificate is withdrawn by the Hungarian Chief Post and Telegraph Administration must be dismissed immediately.

The owner (or charterer) of the ship must give immediate notice of any change in the personnel of the wireless staff to the Chief Post and Telegraph Administration and also to the Hungarian Naval Authorities.

In accordance with Rule X sub-section 4 of the Wireless Service Regulations "the service of the wireless station on board is under the chief supervision of the captain of the ship." Hence the holder of this licence must order the captain of the ship to take the oath of loyalty and for the preservation of the secret of messages, before a representative of the Hungarian Post Office.

SEC. 11.—The wireless station is intended for public correspondence and may therefore be used by anybody for sending messages against payment of the prescribed fees and observance of the rules laid down for the telegraph service.

On the other hand, in accordance with Rule 3 of the International Wireless Agreement the wireless station on board must exchange wireless messages with any and every other such station on shore or afloat—irrespective of the system used by such stations for receiving or sending wireless messages.

The operators of the wireless station on board must refuse to accept any message which, if transmitted to any part of the territory of Hungary, may endanger the safety of the Hungarian State, or the contents of which may form a breach of the country's laws or offend against public order or morality.

Should the person handing in the message still insist on its transmission the captain of the ship is to be appealed to, whose decision in the matter is to be considered final.

SEC. 12.—The fee for transmitting a wireless message from the ship is fixed at 40 fillérs per

rateable word with a minimum fee of 4 crowns per message.

The Minister, however, reserves himself the right to modify this rate of fees at any time even during the duration of this licence or to fix a new tariff for messages sent.

SEC. 13.—The fees referred to in the previous section may be retained by the holder of this licence.

Messages which at telegraph stations of the State are accepted for free transmission or are transmitted on the credit system must be accepted and transmitted by the holder of this licence on the same terms.

SEC. 14.—In dealing with telegrams and preparing accounts the wireless station on board must only use dating stamps, printed forms and books that are prescribed for use and are issued for this purpose by the Hungarian Post who will supply them to the holder of this licence at cost price on his written application to the Chief Post and Telegraph Administration.

The holder of this licence is obliged under all circumstances to keep within easy reach a copy of each of the following service books for the use of the wireless station staff on board—the International Telegraph Agreement with the Service Regulations pertaining thereto, the International Wireless Agreement with the Service Regulations pertaining thereto, the Nomenclature Officielle des Bureaux Télégraphiques, the Nomenclature Officielle des Stations Radiotélégraphiques, the Liste Alphabétique des Indicateurs d'Appel, the book of telegraph rates and Parts I and II of the Telegraph Service Regulations, the book of telegraph fees issued for Hungarian wireless stations on ships, and also a copy of the Post and Telegraph Instructions. The holder of this licence must also take care that all these books are corrected and kept up to date by the wireless staff in conformity with the additions and corrections periodically issued by the International Telegraph Bureau and in the collection of Postal and Telegraph Regulations.

SEC. 15.—The holder of this licence is fully responsible financially for all claims of every kind raised on any legitimate grounds against the Hungarian Post Office by anybody for the return of fees paid or indemnification in cases arising from the service of the wireless station on board his ship.

The holder of this licence is fully responsible financially for all telegraph fees of every kind payable under International agreements in accordance with telegraph tariffs arising from the telegraph service of the wireless station on his ship.

These fees—at the financial responsibility of the holder of this licence—are collected in cash by the staff of the wireless station on his ship who are bound to keep and render correct accounts and also supply a list of all the wireless messages received, sent or relayed by the station. The Chief Post and Telegraph Administration issues proper forms for making out such accounts and lists with the necessary instructions for dealing with these forms.

The holder of this licence or the manager of the wireless station in his place—in accordance with Rule XL of the International Wireless Service Regulations—must once a month or in any case within eight days of the ship's return to port from every voyage send at the expense of the holder of this licence to the Section III of the Audit Department of the Ministry of Commerce the following papers and documents carefully arranged and packed: the originals of all wireless messages, all

records of messages transmitted, all receipts for delivery of wireless messages received and all documents and accounts in connection therewith.

Prior to this, however, the holder of this licence or the manager of the wireless station in his place must prepare an account of all fees received in connection with the working of the wireless station on board and after deducting the fees due to the holder of this licence or to the wireless station on board he must pay in the remaining balance at the Hungarian Post and Telegraph Office No. 1 duly receipting on the account the sum retained by the station on the ship of the holder of this licence.

The holder of this licence or the manager of the wireless station on board respectively may only communicate with foreign telegraph authorities or with the International Bureau of the Telegraph Association at Bern through the medium of the Hungarian Chief Post and Telegraph Administration.

SEC. 16.—In home ports the wireless station may not transmit telegrams unless specially authorised to do so by the Chief Post and Telegraph Administration.

When visiting foreign parts, any special regulations in force in the country of sojourn must also be respected in addition to the regulations of the International Wireless Agreement and the Service Rules prescribed therein.

It is the duty of the owner (or charterer) to make himself acquainted with these.

SEC. 17.—The Hungarian Chief Post and Telegraph Administration may at any time have the wireless station examined by their inspectors and its service checked.

The owner (or charterer) of the ship undertakes to afford means to the inspectors of the Hungarian Chief Post and Telegraph Administration, as well as to officers of the Navy, through the mediation of the Hungarian Chief Post and Telegraph Administration to make themselves thoroughly acquainted in every detail with the handling of the wireless apparatus and to acquire the necessary practice therein.

The owner (or charterer) of the ship must not consent to any stipulation on the part of the supplier of the wireless apparatus that the arrangement of the apparatus or any part thereof should be kept secret and not be shown to the inspectors of the Hungarian Post and Telegraph Administration or to the officers of the Navy.

The owner (or charterer) of the ship undertakes to carry the inspectors and naval officers thus appointed for the study of the apparatus and training in its manipulation free of charge in a class of the ship corresponding to their rank, also to find them, free of charge, cabin accommodation and to make it possible for them to pay for their board at cost price.

Two such persons, however, may only travel on the ship on the same voyage.

SEC. 18.—As an acknowledgment of the right reserved to the State and to defray the costs incurred in the regular control of the wireless station on board, the holder of this licence undertakes to pay the sum of twenty (20) crowns to the Post and Telegraph Office No. 1 within the first half of January every year.

Should an inquiry become necessary owing to any alleged neglect or fault on the part of the owner (or charterer) of the ship or one of his employees, and should such enquiry prove that the holder of this licence or his employee is at fault, the holder of this licence would be obliged

to refund to the Treasury the whole of the costs arising from such enquiry.

SEC. 19.—The Hungarian Chief Post and Telegraph Administration has the power to mulct the holder of this licence in a penalty not exceeding 100 crowns for any neglect or fault in the wireless service provided such omission or commission does not form an act of misdemeanour or a crime. 1. the wireless station on board should not attend to its duties after repeated warnings, or should the service of the station clash with the public interests, the Hungarian Minister of Commerce shall have the power to inflict eventually a higher penalty of from 100 to 1,000 crowns or to make arrangements to have the wireless service of the station performed by a delegate of the Minister specially appointed for the purpose at the expense and responsibility of the shipping undertaking, and to have any apparent shortcomings in the arrangement of the wireless apparatus put right and any required alterations made at the expense of the holder of this licence, or as an alternative the Minister may suspend or cancel the licence for the working of the wireless apparatus.

SEC. 20.—The period during which the present licence will remain in force is ten (10) consecutive years counting from the date of the licence.

Should the holder of this licence not install the wireless apparatus within a year counted from the date of the present permit, this permit will be cancelled and the holder of the licence will have to return it for cancellation to the Minister.

SEC. 21.—In accordance with the provisions of Section XXI sub-section 3 of the Law of 1888 and in conformity with the decree issued by the Minister of Commerce under No. 62574/1913 in the matter of establishing wireless stations on sea-going passenger ships, the whole of the wireless installation with all its accessories (including furniture, fittings), as well as the installation for sending out distress signals, is to be handed over to the Hungarian Post Office in perfect working order free of cost and without any claims at the expiry of the period specified in the present licence.

Should the Hungarian Post not wish to undertake themselves the service of the station thus handed over to them but to leave its further working in the hands of the holder of this licence, the owner (or charterer) of the ship undertakes to make an annual payment of twenty (20) crowns in acknowledgment of the proprietary right over the installation thus acquired by the State over and above the payment specified in section 15 payment of both sums to be made simultaneously.

Should a ship be put out of commission the licence for the maintenance and working of the wireless station thereon becomes null and void and the holder of the licence shall give the Hungarian Chief Post and Telegraph Administration due notice of the fact. Should it be desired to transfer the wireless installation and re-erect it on another ship, this can only be effected under a new licence.

SEC. 22.—The Minister reserves himself the right to take possession temporarily or permanently, on behalf of the State, of the wireless station at any time even before the expiry of the present licence without giving any explanation whatever for taking such a step.

Should the installation be taken over temporarily the holder of this licence undertakes to hand over for use free of charge the whole of the apparatus with all accessories, fittings and stores for working it as well as the

office wherein it is housed and the cabins for the accommodation of the operators without any claim for indemnity, also to supply free of charge the power required for working the installation, also to provide free of charge all necessaries (board, medical assistance and servants, etc.) required by the operators. As against all these services all fees collected for wireless messages are to be handed over in this instance also to the holder of this licence.

Under normal conditions six months' previous notice will be given if the installation is to be taken over permanently, but the Hungarian Minister of Commerce reserves himself the right to shorten the period of this notice or to take possession of the station at any time without any notice at all, should public interest call for such a step.

Should the working of the installation be taken over by the State permanently before the expiry of this licence, the Hungarian Post Office will indemnify the holder of this licence for the technical parts of the wireless apparatus by paying him the cost as per invoice or other evidence to be produced by him less ten (10) per cent. for every year during which the installation has been in use. The balance thus remaining will be paid to him by the Post and Telegraph Administration at Budapest.

Beyond this indemnity to be paid to him the holder of the licence shall not be able to sue in any court for any claim for loss of profit or for the payment of any other indemnity under any other pretext whatever.

SEC. 23.—The Minister reserves himself the right to suspend at any time the service of the wireless station for an indefinite period, or permanently, or for messages of a certain kind without having to assign any reason for such an order and without incurring any liability for damages caused by the suspension.

In case of an order being issued for mobilisation in Hungary, and in time of war, the wireless station on board is to be closed down altogether unless the captain receives instructions to the contrary from the Hungarian Chief Post and Telegraph Administration.

The captain will be held personally responsible for the compliance with this direction.

In other respects the holder of this licence will have to carry out all special orders to be issued in times of an eventual mobilisation or war.

SEC. 24.—This licence may only be transferred to another person with the Minister's special consent to be applied for in advance.

SEC. 25.—Should any difference of opinion arise between the State and the holder of this licence as to the correct interpretation of any of the stipulations of the present licence the matter or matters at issue shall not be referred to any Court of Justice but shall be settled by the Minister of Commerce in the usual official way, adopted by the Public Administration.

SEC. 26.—Every copy of the present licence issued officially is subject to a fixed stamp duty amounting to two crowns.

Budapest, 19 .

By the Order of the Minister,
Chief Director of Posts and Telegraphs.

CERTIFICATE.

C FOR THE SHIP STATION on board the Hungarian vessel

The general administration of Posts and Telegraphs of Hungary attests that the ship station on board the Hungarian vessel was installed on the basis of the licence of the Hungarian Govern-

ment and that the installation of the ship station complies with the conditions prescribed by the service regulations annexed to the International Radiotelegraph Convention.

The ship station is classed in the category from the point of view of its obligations as to hours of service.

Normal range in nautical miles :

Day
Night

Budapest, the
General Administration of Posts and Telegraphs of Hungary.

OPERATOR'S CERTIFICATE.

D The Commission, delegated by the Hungarian Minister of Commerce, has submitted Mr.

born at on the to an examination of the radiotelegraph service and tested his professional ability as regards :

(a) The adjustment of apparatus and knowledge of its working.

(b) The speed of—

Transmission

.....words per minute.

Reception by sound

.....words per minutes.

(c) Knowledge of the regulations applicable to the exchange of radiotelegraph communications.

In testimony whereof the Ministry of Commerce of Hungary has, by virtue of Article X of the International Radiotelegraph Convention issued this Class Certificate to Mr. who at the conclusion of the examination took the oath of

secrecy of correspondence.

Made at , the

19. .

FORM OF LICENCE FOR PRIVATE RECEIVING STATIONS.

E 1. Whereas the erection, equipment and operation of telegraph, telephone and other electrical signalling installations are a State monopoly, the Ministry of Commerce, in accordance with the Act XXXI of 1888, and under the regulations issued on 18th July, 1890, licences

to install a wireless receiver exclusively for instructional scientific research and experimental purposes in conformity with the diagram and technical description attached to this licence, and to operate it during the period covered by this present document upon the conditions specified below :—

2. The licensee must conform strictly—

(a) To the Act XXXI of 1888, and to Regulation No. 23445/V issued on 15th July, 1892.

(b) To the conditions of this licence.

(c) To all other valid laws, regulations, decrees and orders already in force, or which may be issued during the term of this licence.

3. The receiver licenced must be installed in strict conformity with the diagrams approved and the description attached, and at the place specified in this document. It is necessary to obtain the sanction of the Ministry of Commerce before making any alteration in this installation which may affect its reception of signals.

4. The licensee must purchase all materials, apparatus and other accessories necessary for installing and operating the station in this country. If this be found impossible the Royal Hungarian Ministry of Commerce may grant a special exception to this rule.

5. The licensee must use his installation solely for educational, scientific research, and experimental purposes. He is not allowed to communicate signals to a third party, nor to use his station for conducting his own correspondence. Nor may he allow any unauthorised persons to use his installation.

6. This licence is available for ten years reckoned from the date of this document.

7. For an extension of this licence the holder must apply during the first part of the tenth year. In the event of an extension of the licence not being granted before the expiration of the time specified therein, the licensee must dismantle and remove his station within 14 days from the expiration of the licence. In the event of his neglecting to do so the regulation under Act XXXI of 1888, section 11, will be enforced.

8. The licence is only transferable to a third party by special permission from the Ministry of Commerce.

9. The Ministry of Commerce reserves the right to inspect the equipment and operation of the station at any time. The persons appointed by the Minister for such inspection and examination are authorised to inspect the licensee's station at any time they may deem fit, and the licensee is bound to afford every facility for such inspection, and to give such information as may be required to enable the inspectors to become familiar with the working of the equipment. The licensee must not withhold from the officials of the Ministry information regarding the apparatus, even though the suppliers may have stipulated that portions of the installation must be kept secret.

10. The Ministry of Commerce may, in the event of the licensee neglecting his duties—if he has not thereby infringed any law—impose a fine not exceeding 4,000 crowns. The licensee must pay this fine within 15 days at the office designated by the Ministry of Commerce.

11. The Ministry of Commerce has the right to prohibit the use of the licensed installation either partially or entirely for a long or short period, and to make its use impossible. No legal action for compensation can be taken with regard to such action by the Ministry.

12. The Ministry of Commerce is entitled to declare this licence withdrawn and cancelled at any time should the licensee neglect any of the regulations specified in this present document. The withdrawal of the licence establishes no claim for compensation nor any liability on the part of the State.

13. Upon the expiration of this licence, either by abandonment or withdrawal, the licensee must remove the installation at his own expense within 14 days from receipt of the notice. Should the licensee neglect to obey the notice within the time specified the Directorate of the Royal Hungarian Posts and Telegraphs will cause the installation to be removed at the expense of the licensee. The Ministry of Commerce reserves the right to take possession of the whole or a part of the installation on the expiration of the licence from any cause and upon payment of a fair compensation.

14. In the event of mobilisation or of war—unless otherwise decreed by the Ministry of Commerce—the station must be put entirely out of working order. The licensee is responsible for carrying out this regulation, and the Ministry of Commerce is entitled to enforce the observance thereof, and if necessary to make the reception of traffic impossible by the removal or destruction of parts of the apparatus.

15. In the event of strikes, emergencies, etc., the Ministry of Commerce may make use of the station for as long as is necessary for the exclusive use of the Royal Hungarian Post or for military purposes, and may put the management into the hands of officials of the Post Office or of the Army.

16. The licensee is allowed to employ only Hungarian citizens for operating the licensed station. The licensee must furnish the Royal Hungarian Post and Telegraph Directorate at _____, without any delays with the names and addresses of such person, and with any change that may occur.

17. The licensee and those authorised to operate the station must observe strict secrecy regarding messages received, especially the contents of State or military telegrams, and must make oath, before the Directorate of Posts and Telegraphs, and sign a written undertaking to this effect.

18. As a recognition of the State Monopoly Rights, and as a contribution towards the expense of superintendence, the licensee must pay a fee of 1,000 crowns on the 1st January in every year to the Directorate of the Royal Hungarian Posts and Telegraphs at _____.

19. If in consequence of a fault or omission on the part of the licensee or of his employees a supplementary inspection is necessary in addition to the regular inspection, the whole expense incurred must be borne by the licensee.

20. Any points of controversy arising between the State and the licensee regarding the interpretation of the conditions of this licence are to be decided by the Royal Hungarian Ministry of Commerce according to the Government regulations and without recourse to legal action.

21. For every copy of this licence a stamp fee of 10 crowns is charged.

Budapest.....1924

DECREE No. 85463 OF 1924 BY THE HUNGARIAN MINISTER OF COMMERCE

F CONCERNING TELEGRAPHY, TELEPHONY AND WIRELESS INSTALLATIONS, AND THE MANUFACTURE AND SALE OF APPARATUS AND COMPONENTS FOR SUCH INSTALLATIONS.

In accordance with the authority given in section 15 of Law No. XXXI of 1888, concerning telegraphy, telephony and other electrical installations, and in section 58 of Law No. XII of 1922, concerning the modifications to the industrial law inserted in the article of Law No. XVII of 1884, with the concurrence of the Ministry of Justice,
I DECREE AS FOLLOWS:—

(1) Whereas the right reserved by the State and fixed by Sect. 1 of Law No. XXXI of 1888, concerning telegraphy, telephony and other electrical installations, applies equally to installations used for the transmission and the reception of signals, news, pictures or sounds by electricity, either wireless or wired, by means of high frequency waves, anyone wishing to establish or exploit upon the territory of the Hungarian State an installation of this nature must apply for the necessary licence from the Ministry of Commerce.

(2) The manufacture, importation, acquisition or possession, either in a warehouse or a private residence, the use, transference and trade in apparatus and articles mentioned in paragraph 1, are subject to the necessary licence from the Ministry of Commerce (Sect. 15, Law XII, 1922).

The manufacture of apparatus and the component parts mentioned in the first paragraph can only be permitted to a manufacturer who, on the basis of a legitimation or regular

trade licence is authorised to make electrical installations (electric lighting, transmission of power or electro-technical) or apparatus, or electrical measuring instruments for the construction and repair of lines or similar work.

The manufacturer, by virtue of his licence, may only transfer the apparatus and component parts made by him to persons who, in accordance with this paragraph, are authorised to possess such articles.

Trading in apparatus and component parts specified in the preceding paragraph, including also its importation from foreign countries, will only be allowed to persons holding an industrial licence for the sale of electro-technical articles.

(3) Applications for the granting of licences specified in paragraphs 1 and 2, must specify precisely and (if necessary), with explanatory drawings attached, the purpose for which the applicant requires the licence. In the event of a licence being granted, the conditions and restrictions exacted in the public interest will be specified in the terms of the licence.

(4) Every person who, at the time of the publication of this regulation, is in possession of radiotelegraphic transmitting or receiving apparatus, or is engaged in the manufacture or sale of such apparatus or its component parts must, within a period of thirty days from the date of publication of this regulation, notify the fact, in writing, to the Ministry of Commerce and apply for the licence prescribed under the present regulations.

In this notification the respective installations of apparatus or of component parts must, within a period of thirty days from the date of publication of this regulation, be notified in writing to the Ministry of Commerce, and application made for the licence prescribed under the present regulations.

In this notification particulars of the installation must be exactly specified (with drawings).

(5) Apparatus and component parts specified in paragraph 2 may only be delivered to those who in each case can prove their right, by the presentation of a permission from the Ministry, to purchase such apparatus or component parts.

(6) Apart from any matter which may come under more severe penalties, a transgression is committed by anyone who:

(1) Without the licence prescribed under paragraph 1 establishes or exploits any installation specified in the term of this paragraph.

(2) Without a proper licence, imports from a foreign country, purchases, uses, delivers or trades any apparatus or component part necessary for any installation specified in paragraph 1.

A transgression covered by sub-section 1 of this paragraph is punishable (in accordance with Sect. 11 of Law XXXI, 1888) by a fine of from 250,000 to 3,000,000 crowns. For a transgression covered by sub-section 2 of the paragraph (in conformity with Sect. 16 of Law XL, 1879: k.6.t.k.), the penalty may be increased by 1,000,000 crowns.

In the case of a transgression covered by sub-section 1 of this paragraph, the District Tribunal takes action on behalf of the Minister of Commerce or his deputy. In the case of a transgression covered by sub-section 2 of this paragraph, the same administrative authority as in the police penal tribunal in the third degree of the Ministry of Commerce (l'autorité administrative comme tribunal penal de police, au degré troisième le Ministre du Commerce) is competent to take action.

(7) In the case of transgressions covered by sub-section 1 of paragraph 6 of these regulations (conforming to Sect. 11 of Law XXXI, 1888), it will be the duty of the authority taking proceedings to put out of action any apparatus used without a licence.

With regard to confiscation, the dispositions of Sect. 61 of the penal code are applicable.

(8) The authorities of the regular post office are to be advised of the date of an inspection to be made in the event of a transgression against the stipulations of the present regulations.

(9) These regulations will come into force 28 days after its promulgation.

Budapest, September 13th, 1924.

(Signed)

ROYAL HUNGARIAN MINISTER OF COMMERCE.

ICELAND

(See Maps 2 and 15)

THE State has a monopoly in the erection and working of wireless stations, but private persons or companies may be permitted to do both under a licence from the Telegraph Department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. M. Gudmundsson	Minister of Public Works	Reykjavik
Mr. O. Forberg	Director-General of Telegraphs	Reykjavik
Mr. G. Hliddal	Chief Telegraph Engineer	Reykjavik
Mr. F. Adalsteinsson	Inspector of Wireless Installations	Reykjavik

The following legislative enactments govern wireless in Iceland:—

A—Act of November 14, 1917.

B—Regulations under the above Act.

ACT OF NOVEMBER 14TH, 1917, CONCERNING THE WORKING OF WIRELESS TELEGRAPH STATIONS IN ICELAND.

I.

A The State has a monopoly in the erection and working of wireless stations on Icelandic soil and within the territorial waters of Iceland.

II.

Within the territorial waters of Iceland, the wireless stations of foreign ships may only be in use in conformity with regulations drawn up by the Ministry of Iceland. The Ministry can prohibit all wireless communication within the territorial waters of Iceland, and take such precautions as may be necessary to ensure the observance of this prohibition.

III.

On board of Icelandic ships which do not belong to the Government, whether they are within or without the territorial waters of Iceland, wireless stations may only be erected and worked with the permission of the Ministry. If the stipulations accompanying this permission as regards the equipment and working of the station are not complied with, the Ministry can withdraw it. Applications for permission to work wireless stations that are in operation when this Act comes into force must be sent to the Ministry not later than eight weeks from the date of this Act. The Ministry will then decide how their future working is to be carried on.

IV.

On Icelandic soil, and within the territorial waters of Iceland, wireless stations, or other means of wireless communication, can only be installed and worked with the consent of the Ministry, and in conformity with the stipulations made by it.

V.

The Regulations contained in the fifteenth paragraph of the Telegraph Act of October 20th, 1905, imposing secrecy upon those engaged in the telegraph service, are equally applicable to wireless operators. Paragraph 16 of the same Act, regarding the same obligation of those engaged in private telegraph service, is also valid as regards wireless telegraph operators on board of ships.

VI.

The violation of this law, or of the Regulations which the Ministry are hereby empowered to make, shall be punished with fines, or with imprisonment for a term not exceeding six months, provided the violation does not involve a more serious punishment. Further, all apparatus illegally installed or worked shall be confiscated. Lawsuits arising from violations of this law, or the corresponding Regulations of the Ministry, shall be tried in public police courts.

B WIRELESS TELEGRAPHY AND TELEPHONY REGULATIONS.

I.

In the present Regulations:

(a) *Wireless Station* means apparatus or other means of conveying signals to a distant point without any intermediate conductor.

(b) *Wireless Operator* means a person employed in the operating of all sorts of apparatus for wireless telecommunication.

(c) *Ministry* means the Ministry of Iceland.

(d) *Wireless apparatus* means apparatus used for transmission and reception of intelligence between distant points, without any intervening conductor.

I.—ERECTION OF WIRELESS STATIONS.

II.

On Icelandic soil, or within the territorial waters of Iceland, or on ships registered in Iceland, a wireless station must not be erected or worked without a special permit of the Ministry, who will issue a licence for such station. This licence, or a certified copy of it, must always be kept at the station named therein. If the stipulations contained in this licence are not complied with, it may be withdrawn and the station dismantled.

III.

Applications for a licence to erect and work a wireless station must be sent to the Director-General of Telegraphs.

The installation of wireless stations on board ships must comply with the stipulations of Paragraph VII of the International Regulations of Wireless Telegraphy.

A wireless station must not be opened for correspondence before the Director-General of Telegraphs has declared the equipment complies with the stipulations contained in the licence.

2.—INSTALLATION AND OPERATION OF PRIVATE SHIP STATIONS.

IV.

The wireless apparatus of a ship station must always be maintained in strict accordance with the stipulations of the licence.

V.

The Director-General of Telegraphs fixes the hours of service for each coast station.

Ship stations are, as regards hours of service, divided into three classes:

1. Stations permanently open.
2. Stations with limited hours of service.
3. Stations with no fixed hours of service.

During navigation a constant aural watch must be kept at stations of the first class. On stations of the second class watch must be kept during the hours of service, and also during the first ten minutes of each hour. At stations belonging to the third class no regular watch need be kept.

VI.

All ship stations must be so equipped as to permit both transmission and reception with 300 and 600 metre wavelengths; 600 metres is the normal wavelength of all ship stations.

An exception to this rule may be made in the case of small vessels, where it is difficult to produce a wavelength of 600 metres, when permission may be given to use 300 metre wavelengths for transmission, but every station must be able to receive wavelengths of 600 metres.

First and second class ship stations must be fitted with an auxiliary transmitting set provided with an independent power supply able to work for at least six hours continuously. This set must be fixed in as safe a position as possible, and must have a minimum range of eighty miles for third class stations and fifty miles for second-class stations.

On ships where the main installation is such as to fulfil the conditions laid down for the auxiliary set, the latter is not required.

VII.

Ship stations should be operated by either one or two wireless operators licensed by the Director-General of Telegraphs.

Wireless operators holding certificates issued by foreign administrations may be permitted to operate ship stations, but a separate permit must be obtained for each voyage.

The certificate states:—

(a) That the holder understands the wireless apparatus and how to operate it.

(b) That the holder is able to both transmit and to receive Morse signals at a speed of not less than

(1) Twenty words a minute in the case of first-grade operators, and

(2) Twelve words a minute in the case of second-grade operators.

(c) That the holder possesses an adequate knowledge of the Regulations affecting wireless telegraphy.

Furthermore, the certificate contains the holder's pledge of secrecy, whereby he is subject to the same law as telegraph operators of the telegraph administration, and the same penalties for violation.

Second-grade wireless operators are permitted to operate ship stations which are only for the ship's own use or that of the crew. Furthermore, they are entitled to operate other stations having at least one first-grade operator.

First-class ship stations are bound to be operated by at least two first-grade wireless operators.

Wireless operator's certificates must always be kept in the wireless cabin, where they can be seen by the radio inspectors of the telegraph department.

VIII.

So far as it is possible all ships stations are bound to exchange traffic with other stations, without regard to the wireless telegraph system of the station concerned. The exchange of traffic between ships must be so arranged as to interfere as little as possible with that of the coast stations, which are generally given priority in public correspondence.

As a general rule, the wording of every station must be so arranged as to cause the least possible disturbance in the traffic of other stations. All unnecessary transmission of signs or words is strictly forbidden. Experiments and tests are only permitted in so far as they do not interfere with other stations. In such cases as little transmitting energy as possible and none of the ordinary wavelengths should be used.

In an Icelandic port the wireless apparatus of a ship must not be made use of except in case of:—

(a) The ship being in distress.

(b) The ship being in communication with a ship in distress.

(c) The ship being in a port where there is no telegraph or telephone station.

(d) The ship being, for some reason or other, unable to communicate with the shore otherwise than by wireless.

As regards (c) and (d) the permission of the nearest shore station within the ship's range must be obtained.

IX.

Whenever it is considered necessary, the telegraph department arranges an inspection of each ship's station by persons appointed therefor by the Director-General of Telegraphs.

All their orders and arrangements relating to the maintenance and operation of the wireless apparatus must be closely followed. Inspectors are required to supply the Director-General with a report of the inspection of each station.

3.—HANDLING OF RADIOTELEGRAMS.

X.

All wireless stations, except those intended for a special limited correspondence (see Paragraph XI), are required to accept public correspondence.

Messages are divided into three classes:—

1. Government messages.

2. Service messages.

3. Public correspondence.

The handling of these messages on the land lines will be in accordance with the domestic and international regulations governing the telegraph service. The handling of radiotelegrams between wireless stations will be carried out in accordance with Paragraphs XIV-XV, XIX-XL, XLV-XLIX of the International Wireless Telegraph Regulations.

XI.

Ship stations may be utilised for:—

(a) General public correspondence.

(b) Limited public correspondence—*e.g.*, light ships, cable ships, etc.

(c) Private correspondence (with special ships and fishing companies).

In general public correspondence the following special radiotelegrams may be accepted:—

1. Telegrams with reply prepaid.

2. Telegrams to be repeated.

3. Telegrams to be delivered by mail.

4. Telegrams with multiple addresses.

5. Telegrams with certificate of delivery.

This certificate is only issued as regards delivery from the wire to the nearest wireless station.

6. Paid service messages.

7. Express telegrams. These are, however, only transmitted as such along the ordinary land lines.

All stations are bound to give precedence to inquiries from ships in distress.

Ship stations have no responsibility as regards the exchange of radiotelegrams.

Ship stations that are open for general public correspondence will, against payment, be supplied with all printed forms, journals, etc., by the telegraph department; these stations are bound to be governed by all instructions of the Director-General of Telegraphs as regards operation of the apparatus and handling of the traffic.

XII.

The complete charge for a radiotelegram includes:—

1. The wireless charges:—

(a) The shore fees (belonging to the shore station).

(b) The ship fees (belonging to the ship station).

(c) The transit fees (belonging to an intermediate land or ship station that may be required to handle the message).

2. The wire charges.

The shore charges in this country shall be 40 cents a word, and not less than 4 frs. for each message.

The ship fees are fixed by the shipowner with the approval of the Director-General. They must not exceed 40 cents, and the minimum charges must not be more than that for a ten-words message. Service messages *re* wireless traffic, that has only

passed between wireless stations, are not free of charge on the land lines. Press telegrams at half rate are not accepted.

XIII.

The entire charge for handling a radio-telegram from sender to addressee is to be charged to the sender. It is not permitted to charge more than stated in the tariff books.

XIV.

Every shipowner is liable for all charges collected on board his ships.

XV.

Each ship station is bound to send, once monthly, all original radiotelegrams, with relative vouchers, to the Director-General of Telegraphs.

XVI.

Reimbursement of charges, and accounts with the Telegraph Department, are to be governed by the Paragraphs XLI and XLIII of the International Radiotelegraph Service Regulations.

4.—EXPERIMENTAL AND AMATEUR STATIONS.

XVII.

Those wishing to erect an experimental or amateur wireless station must send an application for permission therefor to the Director-General of Telegraphs.

The applicant must prove his ability to transmit and receive at not less than ten words a minute in the Continental Morse code, and that he possesses an elementary knowledge of the science of wireless telegraphy. The application must be accompanied by drawings, and an accurate specification of the

station to be erected. Such stations will not be permitted to radiate waves of greater length than 200 metres.

In the event of a licence being granted to such stations the licensee must sign a declaration of secrecy.

5.—OTHER STIPULATIONS.

XVIII.

The stipulations of Paragraph VIII, *re* use of wireless apparatus in ports, are also valid as regards foreign vessels.

XIX.

The Ministry may prohibit all radiotelegraphic communication within the territorial waters of Iceland, by both Icelandic and foreign vessels, and may make the necessary arrangements to enforce this prohibition.

The Ministry can, furthermore, exercise a censorship over all such radiotelegraphic traffic, and stop any radiotelegram that is considered to be harmful to the safety of the State.

XX.

Violations of these Regulations are liable to a fine not exceeding 10,000 krónur, or imprisonment for a term not exceeding six months, if the transgression does not involve a more severe punishment. Illegally erected or operated wireless apparatus will be confiscated.

Lawsuits arising from the violation of these Regulations will be tried in public police courts.

XXI.

These Regulations shall come into force immediately.

Date of Issue: May 17th 1918

INDIA (BRITISH)

(See Maps 16, 17 and 18)

Including: Baluchistan, Sikkim, Andaman and Nicobar Islands, Laccadive Islands.

CONTROL.

THE control of radiotelegraphy in India is vested in the Director-General of Posts and Telegraphs. With the exception of portable or semi-portable stations worked by the Army and Royal Air Force, and the mobile stations in ships of the Royal Indian Marine which are controlled by the Director, Royal Indian Marine, Bombay, all Government stations in British India are controlled by the Director-General of Posts and Telegraphs or the Local Government. Privately owned stations in British India are worked under licence from the Director-General.

In certain Indian States, state-owned stations are open. These work under conditions *specifically* laid down in each case by the Government of India pending the settlement of general conditions governing the erection and operation of stations in Indian States. There are no licensed stations in the Indian States.

The Indian Wireless Board was formed in 1920 to co-ordinate all radio requirements in British India.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. G. R. Clarke, C.S.I., O.B.E., M.L.A., I.C.S.	Director-General of Posts and Telegraphs ..	Simla
Commander R. L. Nicholson, D.S.O., late R.N.	Director of Wireless Telegraphs	Simla
Mr. P. J. Edmunds	Divisional Engineer, Wireless (Research) ..	Karachi
Mr. N. H. Swinstead	Divisional Engineer, Wireless (Traffic) ..	Simla
Mr. P. Ryan	Divisional Engineer, Wireless (Engineering) ..	Karachi
Mr. R. N. Hawes	Divisional Engineer, Wireless (Instruction) ..	Karachi
Mr. S. W. Longhurst	Assistant Divisional Engineer, Wireless ..	Simla
	Assistant Divisional Engineer, Wireless ..	Karachi

ORGANISATION.

The general organisation of radio stations and their intended development is set out in the following Memorandum dated 26th January, 1922 :—

EXTRACTS FROM MEMORANDUM.

DEVELOPMENT OF WIRELESS COMMUNICATION IN BRITISH INDIA.

Note (1).—This Memorandum has received the sanction of the Government of India.

Note (2).—It does NOT include wireless communication with the United Kingdom and other parts of the world, but the policy outlined will fit in with the scheme of Imperial Wireless Communications approved by the Imperial Government.

I.—DEFINITIONS.

Coast Station.—A station whose primary function is communication with ships at sea.

Inland Station.—A station whose primary function is communication with other fixed stations in British India.

II.—GENERAL.

Government of India have the exclusive privilege of erecting, maintaining and working wireless telegraphs in British India and exercise this right by maintaining stations open for public correspondence and by granting licences to private individuals to erect and work wireless telegraphs in British India and in ships and aircraft registered in British India.

2. Besides a number of portable and semi-portable stations of small power which are employed as temporary stations where and when required and the stations in Sandheads Pilot Vessels, the Government of India maintain the following permanent stations :—

(a) *Coast Stations.*—Bombay, Calcutta, Karachi, Madras, Port Blair, Rangoon, Victoria Point.

(b) *Inland Stations.*—Allahabad, Delhi, Lahore, Mhow, Nagpur, Peshawar, Quetta, Secunderabad, Jutogh, Poona.

III.—COAST STATIONS.

3. Ordinarily about half the daily programme of these stations has to be given over to communication with Inland stations. At the large ports and important cities, a programme so divided neither fulfils the requirements of the ship traffic nor provides anything approaching the necessary service required by the Inland organisation. It is therefore necessary to have separate stations at such places, and it is intended to provide separate Inland and Coast stations at the following ports :—

Rangoon, Bombay, Calcutta, Madras, Karachi.

IV.—INLAND STATIONS.

5. (a) The Inland stations together with the Coast stations (during the times the latter are not working with ships) form the nucleus of an organised wireless service, which provides facilities for Government, public and press traffic at the Inland Telegraph rates between these places. This may be termed the "Inland System."

(b) The functions of the Inland system are to supplement land lines, relieve congestion thereon, and to provide an alternative for the same in case of interruption. At present no Inland stations are erected to connect places between which no land line exists, but there is no reason why this should not be done, if required.

(c) If the functions are to be performed and the system run on a commercial basis, stations must be equipped so that they are

on an equality with land lines as regards speed of working and accessibility. Further, they must be used fully in normal times, so as to be kept efficient for service in emergency.

(d) At present the service is limited owing to :—

(i) Low speed of working ;

(ii) Telegraph lines being generally capable of carrying the normal traffic ;

(iii) Stations being situated at a distance from the telegraph office, necessitating considerable rehandling of messages sent by wireless.

(e) It is intended to overcome these limitations by fitting high-speed apparatus and arranging that the stations are operated from the telegraph offices. It is also intended to fit all Inland stations with continuous wave apparatus.

V.—FEEDER STATIONS.

6. It will be seen, therefore, that apart from its temporary limitations the Inland system's facilities are restricted to the principal ports, cities and centres of India. In order to extend these facilities and feed and distribute from the Inland system in localities where such extension is necessary and to provide alternative routes for traffic, it is proposed to permit the installations of groups of small stations working as units.

7. Such a unit may consist of any number of stations termed "*Feeder Stations*," whose power, range, etc., will depend on the local requirements.

8. If it is required that a particular group of Feeder stations shall be linked to the Inland system, one station in the group must be close to the Inland station of the locality. This is termed the "*Main Feeder Station*" of the group.

9. If such linking is *not* required, no Main Feeder station is necessary.

10. If, however, such linking is required, but there is no Inland station in the locality, it may be provided by one of the following methods :—

(a) The erection of a Main Feeder station close to the nearest Inland station, making the necessary arrangements with the Local Government in whose locality such Inland station stands ; *or*

(b) Arranging to use a Main Feeder station belonging to another Local Government if such is practicable.

11. *Not to work with Inland Stations.*—In no circumstance can a Feeder station *work direct* with an Inland station. It therefore follows that the type of installation required for Feeder stations is independent of the type of the Inland stations. They may be large, small, fixed, semi-fixed or portable ; generally they will use telegraphy but may be fitted for telephony also, or telephony alone, according to local requirements and conditions.

12. *Communication with other localities.*—Normally this will be *via* the Inland system, but arrangements can be made in special cases to permit inter-communication between Feeder groups of different localities.

13. *General organisation.*—It is intended to develop the organisation on the following lines :—

(a) Government of India will be entirely responsible for the development and working of Inland stations.

(b) Local Governments may decide their

requirements as to the necessity or otherwise of establishing Feeder stations for the purpose of promoting internal security and retain complete control as to their sites, numbers, hours and class of service, etc., subject to the sanction of the Government of India.

(c) Before deciding on the establishment of any Feeder station, Local Governments should consult the military authorities regarding the location and the actual site of the stations and give full consideration to their views. (This does not apply to military sets which are part of the equipment of the Army; they will normally not be part of the Feeder organisation.)

(d) Government of India will advise as to types most suitable for Feeder stations in any locality and are prepared to obtain, erect, maintain and work the Feeder stations on behalf of the Local Government in accordance with the local requirements, *provided* the local authorities undertake to acquire and maintain the sites and erect the necessary buildings and meet the initial and recurring costs, which will include charges on account of supervision and inspection.

(e) Licences will not be required for Feeder stations erected by Local Governments.

(f) The Government of India reserve to themselves the liberty to take over the system of Feeder stations in any locality on payment of the then value of the buildings and plant.

14. *Personnel.*—(a) The supervising and operating staff will normally be civil, but military personnel may be employed if the Local Government so decide. If civil, this staff may be recruited from General Service Telegraphists or locally according to the requirements of the Local Government.

If this staff is provided by the Department of Posts and Telegraphs, their costs will be included in the total cost of maintaining and working the stations.

(b) Menial staff (engine-drivers, peons, etc.) will be recruited locally, and may be paid by the Local Government or the Department of Posts and Telegraphs as may be most convenient. In the latter case, the Local Government will be debited with the cost.

15. *Apparatus and Plant.*—(a) The Local Government having indicated its requirements, the Department of Posts and Telegraphs will specify, order, obtain and erect the necessary apparatus, subject to the concurrence of the Local Government, the latter meeting the cost thereof which will include the necessary overhead charges.

(b) It is essential that the Department of Posts and Telegraphs should superintend the actual erection and installation of the apparatus, since they will have to look after it subsequently, and the importance of correct first fitting cannot be over-estimated; further, it is easier for the Wireless Engineering Branch efficiently to maintain machinery if they have erected it in the first place, than if they take over running machinery erected by another authority.

16. *Buildings.*—The Department of Posts and Telegraphs can specify the buildings required for any particular set and give approximate estimates, but they must be erected by the Local Government.

17. *Revenue.*—(a) Unless high-speed gear is fitted in the Feeder and Main Feeder stations (which, although not difficult, will in most cases be unnecessary owing to the comparatively small amount of traffic), it must be understood that these stations are more of an insurance

against interruption and congestion upon land-lines than a commercial enterprise.

(b) In the first place Government of India propose that the following should be the general arrangement as regards revenue:—

(i) Except as provided in (iii) below, all messages sent by wireless shall be booked at the telegraph office. Nothing shall be handed in direct to the wireless station unless special instructions to that effect are given;

(ii) Subject to such limitations as the Government of India may from time to time impose, a Local Government shall be permitted to utilise its Feeder stations for the transmission of State traffic pertaining to it and within the limits of the province free of payment to the Central Government.

(iii) If desired, arrangements can be made for local State traffic as mentioned in (ii) to be handed in direct to the wireless stations;

(iv) In the event of interruption or congestion of traffic on the land-lines, public or commercial traffic may be transferred by arrangement between the Postmaster-General and the Local Government to a Feeder-station for transmission. In such case the receipts shall be divided between the Department of Post and Telegraphs and the Local Government on terms which will be announced from time to time.

(v) In cases of emergency the Local Government shall have complete power to decide the communications which shall be maintained between the stations, the class of traffic that shall be carried and every other matter concerning the working of the Feeder stations in the locality. Provided always that the Department of Posts and Telegraphs is kept aware of the arrangements made.

(vi) In all cases the Local Government shall have the power to decide the priority of traffic.

(vii) Unless arrangements are made to the contrary, messages passing from a Civil or Military Feeder group to the Inland system shall be paid for on entry into that system; the method of payment to be arranged between the administration responsible for the Feeder group and the Department of Posts and Telegraphs.

18. *Operation, Supervision and Upkeep.*—

(a) The Department of Posts and Telegraphs will be entirely responsible for training the supervising and operating staff, and will also be responsible that suitable and sufficient supervisors are placed in charge of stations or groups of stations.

(b) The Department of Posts and Telegraphs will also be responsible for advising the Local Government as to steps to be taken for the upkeep and improvement of stations, and are prepared to put into execution such orders as the Local Government may issue, provided that if such orders entail expenditure, the Local Government shall find the money.

(c) The Department of Posts and Telegraphs will also arrange for periodical inspections of the stations.

(d) The technical administration of the stations will be in the hands of the Divisional Engineer, Wireless Engineering Division, as is the case with Inland stations.

19. *Communications between the Local Government and Post and Telegraph Department.*—

(a) On general questions communications should be direct between the Local Government and the Director-General of Posts and Telegraphs.

(b) On purely technical questions it is desirable that the senior wireless officer in charge of the stations of the locality should be general adviser to the Local Government, and that all correspondence should be referred to him for remarks before being forwarded to the Director-General of Posts and Telegraphs.

(c) The Divisional Engineer, Wireless Engineering Division, should be allowed to correspond direct with the wireless officers in charge of stations on matters concerning the technical administration of such stations.

(d) The Director-General of Posts and Telegraphs or his representative should have free access to any of the stations at all times.

VI.—LICENSED STATIONS.

20. Licences to import, erect, maintain and work wireless telegraphs in British India may be granted to persons approved by the Government of India. These licences will embrace the following types of stations:—

(a) Non-commercial stations, which are those erected for experimental, instructional and research purposes and by amateurs.

(b) Limited commercial stations, which are those erected to provide wireless facilities for the purpose of business or private communications, which facilities the Government of India are unable or unwilling to provide. Licences for these stations will be given on the understanding that the Government of India or Local Government shall be at liberty to take over the station at any time

on a 12 months' notice and on payment of such valuation of the buildings and plant as may be agreed between the parties, subject to reference to arbitration in the case of failure of agreement.

21. Licences will be issued to approved applicants on behalf of the Governor-General in Council by the Telegraph Authority (Director-General of Posts and Telegraphs) subject to the concurrence of the Local Government concerned. Applications for licences should normally be forwarded through the Local Government, and in all cases will be referred to the Local Government for remarks and concurrence before the licence is issued.

22. Licensed stations will be of small power and may be used for private communications, research, experiment or instruction. They may be either telegraph or telephone sets.

23. The licences provide, *inter alia*, for:—

(i) The protection from interference with Government of India, Local Government and other licensed stations;

(ii) Government of India to take them over in times of emergency;

(iii) Inspection by Government of India.

24. Licensed stations will be entirely controlled by the Department of Posts and Telegraphs (Wireless Branch) subject to such consultation with and reference to the Local Government concerned as may be necessary.

* * * * *

ADMINISTRATION.

The administration of radio in British India is governed by the following Acts, Notifications and Regulations:—

A—Indian Telegraph Act, 1885, as modified by subsequent Acts (VII and XIV of 1914).

B—Notifications under the Sea Customs Act, 1878.

C—Notifications under the Indian Telegraph Act.

D—Extracts from the Indian Merchant Shipping Act, 1923, and Notifications under the same.

E—Instructions governing Licences for Wireless Telegraphs in British India.

F—Import (Wireless Telegraphs) Licence.

G—Fixed Stations Licence.

H—Mobile Stations Licence.

Licences to work wireless telegraphs for business or experimental or instructional purposes are issued, and the question of permitting "Broadcasting" under licence by private individuals is being considered.

The situation as regards radio in the Indian States is not quite so clear as in British India, but Government are taking steps to obtain the co-operation of the States and are endeavouring to make the conditions therein similar to those obtaining in British India.

INDIAN TELEGRAPH ACT, 1885.

ACT No. XIII of 1885.

[As amended by Act, 1914 (VII of 1914) and Act, 1914 (XIV of 1914).]

An Act to amend the law relating to Telegraphs in India.

A Whereas it is expedient to amend the law relating to Telegraphs in India, it is hereby enacted as follows:—

PART I.—PRELIMINARY.

1. (1) This Act may be called the Indian Telegraph Act, 1885;

(2) It extends to the whole of British India including the Sonthal Parganas and the pargana of Spiti, and it applies also to—

(a) All native Indian subjects of His Majesty in any place without and beyond British India,

(b) All other British subjects within the territories of any Native State in India, and
(c) All servants of the King, whether British subjects or not, within the territories of any native State in India.

(3) It shall come into force on the first day of October, 1885.

2. The Indian Telegraph Act, 1876, is hereby repealed.

But all licences granted and rules made under that Act or any Act thereby repealed, and now in force, shall, so far as they could be granted

or made under this Act, be deemed to have been respectively granted and made hereunder.

3. In this Act, unless there is something repugnant in the subject or context :—

(1) "Telegraph" means an electric, galvanic or magnetic telegraph, and includes appliances and apparatus for making, transmitting or receiving telegraphic, telephonic or other communications by means of electricity, galvanism, or magnetism ;

(2) "Telegraph officer" means any person employed either permanently or temporarily in connection with a telegraph established, maintained, or worked by the Government, or by a person, licensed under this Act ;

(3) "Message" means any communication sent by telegraph, or given to a Telegraph officer to be sent by telegraph, to be delivered ;

(4) "Telegraph line" means a wire or wires used for the purpose of a telegraph with any casing, coating, tube or pipe enclosing the same and any appliances and apparatus connected therewith for the purpose of fixing or insulating the same ;

(5) "Post" means a post, pole, standard, stay, strut or other above ground contrivance for carrying, suspending or supporting a telegraph line ;

(6) "Telegraph authority" means the Director-General of Posts and Telegraphs, and includes any officer empowered by him to perform all or any of the functions of the Telegraph authority under this Act :

(7) "Local authority" means any Municipal Committee, District Board, body of Port Commissioners or other authority legally entitled to, or entrusted by the Government with, the control or management of any Municipal or Local fund.

PART II.—PRIVILEGES AND POWERS OF THE GOVERNMENT.

4. (1) Within British India, the Governor-General in Council shall have the exclusive privilege of establishing, maintaining and working telegraphs :

Provided that the Governor-General in Council may grant a licence, on such conditions and in consideration of such payments as he thinks fit, to any person to establish, maintain or work a telegraph within any part of British India.

Provided further that the Governor-General in Council may, by rules made under this Act and published in the *Gazette of India*, permit, subject to such restrictions and conditions as he thinks fit, the establishment, maintenance and working—

(a) Of wireless telegraphs on ships within Indian territorial waters, and

(b) Of telegraphs other than wireless telegraphs within any part of British India.

(2) The Governor-General in Council may, by notification in the *Gazette of India*, delegate to the telegraph authority all or any of his powers under the first proviso to sub-section (1).

The exercise by the telegraph authority of any power so delegated shall be subject to such restrictions and conditions as the Governor-General in Council may, by the notification, think fit to impose.

5. (1) On the occurrence of any public emergency, or in the interest of the public safety, the Governor-General in Council or a Local Government, or any officer specially authorised in this behalf by the Governor-General in Council may—

(a) Take temporary possession of any telegraph established, maintained or worked by any person licensed under this Act ; or

(b) Order that any message or class of messages to or from any person or class of persons, or relating to any particular subject brought for transmission by, or transmitted, or received by, any telegraph, shall not be transmitted, or shall be intercepted, or detained, or shall be disclosed to the Government or an officer thereof mentioned in the order.

(2) If any doubt arises as to the existence of a public emergency, or whether any act done under sub-section (1) was in the interest of the public safety, a certificate signed by a Secretary to the Government of India or to the Local Government shall be conclusive proof on the point. *

6. Any Railway Company, on being required so to do by the Governor-General in Council, shall permit the Government to establish and maintain a telegraph upon any part of the land of the Company, and shall give every reasonable facility for working the same.

7. (1) The Governor-General in Council may, from time to time, by notification in the *Gazette of India*, make rules consistent with this Act for the conduct of all or any telegraphs established, maintained or worked by the Government or by persons licensed under this Act.

(2) Rules under this section may provide for all or any of the following, among other matters, that is to say :—

(a) The rates at which, and the other conditions and restrictions subject to which, messages shall be transmitted ;

(b) The precautions to be taken for preventing the improper interception or disclosure of, messages ;

(c) The period for which, and the conditions subject to which telegrams and other documents belonging to, or being in the custody of, Telegraph officers, shall be preserved ; and

(d) The fees to be charged for searching for telegrams or other documents in the custody of any Telegraph officer.

(3) When making rules for the conduct of any Telegraph established, maintained or worked by any person licensed under this Act the Governor-General in Council may, by the rules, prescribe fines for any breach of the same :

Provided that the fines so prescribed shall not exceed the following limits, namely :—

(i) When the person licensed under this Act is punishable for the breach, one thousand rupees, and in the case of a continuing breach a further fine of two hundred rupees, for every day after the first during the whole or any part of which the breach continues ;

(ii) When a servant of the person so licensed or any other person, is punishable for the breach, one-fourth of the amount specified in clause (i).

* As supplied to the Hyderabad Residency Bazaars, the Cantonment of Secunderabad (inclusive of the area hitherto known as the "Contingent Station" of Bolarum), the Cantonment (hitherto known as the "Contingent Station" of Aurangabad) and the Railway lands in the territories of His Highness the Nizam of Hyderabad (other than the Railway lands in Berar and those in the Notifications of the Government of India in the Foreign Department, No. 4564-I, dated the 18th November, 1891, and No. 3244-I. B, dated 26th August, 1897) ; for "to the Local Government" read "First Assistant Resident" (*vide* Foreign Department Notification No. 531-I. B., dated 4th February, 1904).

8. The Governor-General in Council may, at any time, revoke any license granted under section 4, on the breach of any of the conditions therein contained or in default of payment of any consideration payable thereunder.

9. The Secretary of State for India in Council shall not be responsible for any loss or damage which may occur in consequence of any Telegraph officer failing in his duty with respect to the receipt, transmission or delivery of any message; and no such officer shall be responsible for any such loss or damage, unless he causes the same negligently, maliciously or fraudulently.

PART III.—POWER TO PLACE TELEGRAPH LINES AND POSTS.

10. The telegraph authority may, from time to time, place and maintain a telegraph line under, over, along or across, and posts in or upon any immovable property:

Provided that—

(a) The Telegraph authority shall not exercise the powers conferred by this section except for the purposes of a telegraph established or maintained by the Government, or to be so established or maintained;

(b) The Government shall not acquire any right other than that of user only in the property under, over, along, across, in or upon which the Telegraph authority places any telegraph line or post; and

(c) Except as hereinafter provided, the Telegraph authority shall not exercise those powers in respect of any property vested in or under the control or management of any local authority, without the permission of that authority; and

(d) In the exercise of the powers conferred by this section, the Telegraph authority shall do as little damage as possible, and, when it has exercised those powers in respect of any property other than that referred to in clause (c), shall pay full compensation to all persons interested for any damage sustained by them by reason of the exercise of those powers.

11. The Telegraph authority may, at any time, for the purpose of examining, repairing, altering or removing, any telegraph line or posts, enter on the property under, over, along, across, in or upon which the line or post has been placed.

PROVISIONS APPLICABLE TO PROPERTY VESTED IN OR UNDER THE CONTROL OR MANAGEMENT OF LOCAL AUTHORITIES.

12. Any permission given by a local authority under section 10, clause (c), may be given subject to such reasonable conditions as that authority thinks fit to impose, as to the payment of any expenses to which the authority will necessarily be put in consequence of the exercise of the

powers conferred by that section, or as to the time or mode of execution of any work, or as to any other thing connected with or relative to any work undertaken by the Telegraph authority under those powers.

13. When, under the foregoing provisions of this Act, a telegraph line or post has been placed by the Telegraph authority under, over, along, across, in or upon any property vested in or under the control or management of a local authority, and the local authority, having regard to circumstances which have arisen since the telegraph line or post was so placed, considers it expedient that it should be removed or that its position should be altered, the local authority may require the Telegraph authority to remove it or alter its position, as the case may be.

14. The telegraph authority may, for the purpose of exercising the powers conferred upon it by this Act in respect of any property vested in or under the control or management of a local authority, alter the position thereunder of any pipe (not being a main) for the supply of gas or water, or of any drain (not being a main drain):—

Provided that—

(a) When the Telegraph authority desires to alter the position of any such pipe or drain, it shall give reasonable notice of its intention to do so, specifying the time at which it will begin to do so, to the local authority, and, when the pipe or drain is not under the control of the local authority, to the person under whose control the pipe or drain is;

(b) A local authority or person receiving notice under clause (a) may send a person to superintend the work, and the Telegraph authority shall execute the work to the reasonable satisfaction of the person so sent.

15. (1) If any dispute arises between the Telegraph authority and a local authority in consequence of the local authority refusing the permission referred to in section 10, clause (c), or prescribing any condition under section 12, or in consequence of the Telegraph authority omitting to comply with a requisition made under section 13, or otherwise in respect of the exercise of the powers conferred by this Act, it shall be determined by such officer as the Local Government may appoint either generally or specially in this behalf.

(2) An appeal from the determination of the officer so appointed shall lie to the Local Government; and the order of the Local Government shall be final.

PROVISIONS APPLICABLE TO OTHER PROPERTY.

16. (1) If the exercise of the powers mentioned in section 10 in respect of property referred to in clause (d) of that section is resisted or obstructed, the District Magistrate may, in his discretion, order that the Telegraph authority shall be permitted to exercise them.

(2) If, after the making of an order under sub-section (1), any person resists the exercise of those powers, or, having the control over the property, does not give all facilities for their being exercised, he shall be deemed to have committed an offence under section 188 of the Indian Penal Code.

(3) If any dispute arises concerning the sufficiency of the compensation to be paid under section 10, clause (d), it shall, on application for that purpose by either of the disputing parties to the District Judge within whose jurisdiction the property is situate, be determined by him.

(4) If any dispute arises as to the persons entitled to receive compensation, or as to the proportions in which the persons interested are entitled to share in it, the Telegraph authority

NOTE.—The Telegraph Act was declared in force in Upper Burma (except the Shan States) by the Upper Burma Laws Act, 1886 (XX of 1886), s. 6 (1) and is in force there under s. 4. and the First Schedule to the Burma Laws Act, 1898 (XIII of 1898) Bur. Code by which Act XX of 1886 has been repealed; in the Santhal Parganas by the Santhal Pargana Settlement Regulations (III of 1872), s. 3, as amended by the Santhal Parganas Justice and Laws Regulation, 1899 (III of 1899), s. 3, Ben. Code; in British Baluchistan see s. 3 and Schedule to the British Baluchistan Laws Regulation, 1990 (I of 1890), Bal. Code; and in the Angul District by notification under s. 5 of the Angul District Regulation, 1894 (I of 1894), Ben. Code, see *Calcutta Gazette*, 1904, Pt. I, p. 1298.

may pay into the Court of the District Judge such amount as he deems sufficient, or, where all the disputing parties have in writing admitted the amount tendered to be sufficient, or the amount has been determined under sub-section (3), that amount; and the District Judge, after giving notice to the parties and hearing such of them as desire to be heard, shall determine the persons entitled to receive the compensation, or, as the case may be, the proportions in which the persons interested are entitled to share in it.

(5) Every determination of a dispute by District Judge under sub-section (3) or sub-section (4) shall be final:

Provided that nothing in this sub-section shall affect the right of any person to recover by suit the whole or any part of any compensation paid by the Telegraph authority, from the person who has received the same.

17. (1) When, under the foregoing provisions of this Act, a telegraph line or post has been placed by the Telegraph authority under, over, along, across, in or upon any property not being properly vested in or under the control or management of a local authority, and any person entitled to do so, desires to deal with that property in such a manner as to render it necessary or convenient that the telegraph line or post should be removed to another part thereof or to a higher or lower level or altered in form, he may require the Telegraph authority to remove or alter the line or post accordingly.

Provided that, if compensation has been paid under section 10, clause (d), he shall, when making the requisition, tender to the Telegraph authority the amount requisite to defray the expense of the removal or alteration, or half of the amount paid as compensation, whichever may be the smaller sum.

(2) If the Telegraph authority omits to comply with the requisition the person making it may apply to the District Magistrate within whose jurisdiction the property is situate to order the removal or alteration.

(3) A District Magistrate receiving an application under sub-section (2) may, in his discretion, reject the same or make an order, absolutely on subject to conditions, for the removal of the telegraph line or post to any other part of the property or to a higher or lower level or for the alteration of its form; and the order so made shall be final.

PROVISIONS APPLICABLE TO ALL PROPERTY;

18. (1) If any tree standing or lying near a telegraph line interrupts, or is likely to interrupt, telegraphic communication, a Magistrate of the first or second class may, on the application of the Telegraph authority, cause the tree to be removed or dealt with in such other way as he deems fit.

(2) When disposing of an application under sub-section (1), the Magistrate shall, in the case of any tree in existence before the telegraph line was placed, award to the persons interested in the tree such compensation as he thinks reasonable, and the award shall be final.

19. Every telegraph line or post placed before the passing of this Act under, over, along, across, in or upon any property, for the purposes of a telegraph established or maintained by the Government, shall be deemed to have been placed in exercise of the powers conferred by, and after observance of all the requirements of, this Act.

19A. (1) Any person desiring to deal in the legal exercise of a right with any property in such a manner as is likely to cause damage to a telegraph line or post which has been duly placed in accordance with the provisions of this

Act, or to interrupt or interfere with telegraphic communication, shall give not less than one month's notice in writing of the intended exercise of such right to the Telegraph authority, or to any Telegraph officer whom the telegraph authority may empower in this behalf.

(2) If any such person without having complied with the provisions of sub-section (1) deals with any property in such a manner as is likely to cause damage to any telegraph line or post, or to interrupt or interfere with telegraphic communication, a Magistrate of the first or second class may, on the application of the Telegraph authority, order such person to abstain from dealing with such property in such manner for a period of not exceeding one month from the date of his order, and forthwith to take such action with regard to such property as may be, in the opinion of the Magistrate, necessary, to remedy or prevent such damage, interruption or interference during such period.

(3) A person dealing with any property in the manner referred to in sub-section (1) with the *bona fide* intention of averting imminent danger of personal injury to himself or other human being shall be deemed to have complied with the provisions of the said sub-section if he gives notice of the intended exercise of the right as is in the circumstances possible, or where no such previous notice can be given without incurring the imminent danger referred to above, if he forthwith gives notice of the actual exercise of such right to the authority or officer specified in the said sub-section.

19B. The Governor-General in Council may, by notification in the *Gazette of India*, confer upon any licensee under section 4, in respect of the extent of his licence and subject to any conditions and restrictions which the Governor-General in Council may think fit to impose and to the provisions of this Part, all or any of the powers which the Telegraph authority possesses under this Part with regard to a telegraph established or maintained by the Government or to be so established or maintained:

Provided that the notice prescribed in section 19A shall always be given to the Telegraph authority or officer empowered to receive notice under section 19A (1).

PART IV.—PENALTIES.

20. (1) If any person establishes, maintains or works a telegraph within British India in contravention of the provisions of section 4 or otherwise than as permitted by rules made under that section, he shall be punished; if the telegraph is a wireless telegraph with imprisonment which may extend to three years or with fine, or with both, and, in any other case, with a fine which may extend to one thousand rupees.

(2) Notwithstanding anything contained in the Code of Criminal Procedure, 1898, offences under this section in respect of a wireless telegraph shall, for the purposes of the said code, be bailable and non-cognizable.

(3) When any person is convicted of an offence punishable under this section, the Court before which he is convicted may direct that the telegraph in respect of which the offence has been committed, or any part of such telegraph be forfeited to His Majesty.

20A. If the holder of a licence granted under section 4 contravenes any condition contained in his licence, he shall be punished with fine which may extend to one thousand rupees and with a further fine which may extend to five hundred rupees for every week during which the breach of the conditions continues.

21. If any person, knowing or having reason to believe that a telegraph has been established or is maintained or worked in contravention of this Act, transmits or receives any message by such telegraph, or performs any service incidental thereto, or delivers any message for transmission by such telegraph, or accepts delivery of any message sent thereby, he shall be punished with fine which may extend to fifty rupees.

22. If a railway company, or an officer of a railway company, neglects or refuses to comply with the provisions of section 6, it or he shall be punished with fine which may extend to one thousand rupees for every day during which the neglect or refusal continues.

23. If any person—

(a) Without permission of competent authority enters the signal room of a Telegraph office of the Government, or of a person licensed under this Act; or

(b) Enters a fenced enclosure round such a Telegraph office in contravention of any rule or notice not to do so or

(c) Refuses to quit such room or enclosure on being requested to do so by any officer or servant employed therein, or

(d) Wilfully obstructs any such officer or servant in the performance of his duty, he shall be punished with fine which may extend to five hundred rupees.

24. If any person does any of the acts mentioned in section 23 with the intention of unlawfully learning the contents of any message, or of committing any offence punishable under this Act, he may (in addition to the fine with which he is punishable under section 23) be punished with imprisonment for a term which may extend to one year.

25. If any person, intending—

(a) To prevent or obstruct the transmission or delivery of any message, or

(b) To intercept or to acquaint himself with the contents of any message, or

(c) To commit mischief.

damages, removes, tampers with or touches any battery, machinery, telegraph line, post or other thing whatever, being part of or used in or about any telegraph or in the working thereof, he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

25A. If, in any case not provided for by section 25, any person deals with any property and thereby wilfully or negligently damages any telegraph line or post duly placed on such property in accordance with the provisions of this Act, he shall be liable to pay the Telegraph authority such expenses (if any) as may be incurred in making good such damage, and shall also, if the telegraphic communication is by reason of the damages so caused interrupted, be punishable with a fine which may extend to one thousand rupees:

Provided that the provisions of this section shall not apply where such damage or interruption is caused by a person dealing with any property in the legal exercise of a right if he has complied with the provisions of section 19A (1).

26. If any Telegraph officer, or any person not being a Telegraph officer but having official duties connected with any office which is used as a Telegraph office—

(a) Wilfully secretes, makes away with or alters any message which he has received for transmission or delivery, or

(b) Wilfully, and otherwise than in obedience to an order of the Governor-General in Council

or of a Local Government, or of an officer especially authorised by the Governor-General in Council to make the order, omits to transmit, or intercepts or detains any message or any part hereof, or otherwise than in pursuance of his official duty or in obedience to the direction of a competent Court, discloses the contents or any part of the contents of any message to any person not entitled to receive the same, or

(c) Divulges the purport of any telegraphic signal to any person not entitled to become acquainted with the same,

he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

27. If any Telegraph officer transmits by telegraph any message on which the charge prescribed by the Government, or by a person licensed under this Act, as the case may be, has not been paid, intending thereby to defraud the Government or that person, he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

28. If any Telegraph officer or any person not being a Telegraph officer but having official duties connected with any office which is used as a Telegraph office, is guilty of any act of drunkenness, carelessness, or other misconduct whereby the correct transmission or the delivery of any message is impeded or delayed, or if any Telegraph officer loiters or delays in the transmission or delivery of any message, he shall be punished with imprisonment for a term which may extend to three months, or with fine which may extend to one hundred rupees, or with both.

29. If any person transmits or causes to be transmitted by telegraph a message which he knows to be false or fabricated, he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

29A. If any person, without due authority—

(a) Makes or issues any document of a nature reasonably calculated to cause it to be believed that the document has been issued by, or under the authority of, the Director-General of Posts and Telegraphs, or

(b) Makes on any documents any mark in imitation of or similar to, or purporting to be, any stamp or mark of any Telegraph office under the Director-General of Posts and Telegraphs, or a mark of a nature reasonably calculated to cause it to be believed that the document so marked has been issued by, or under the authority of, the Director-General of Posts and Telegraphs.

he shall be punished with fine which may extend to fifty rupees.

30. If any person fraudulently retains, or wilfully secretes, makes away with, or detains a message which ought to have been delivered to some other person, or, being required by a Telegraph officer to deliver up any such message, neglects or refuses to do so, he shall be punished with imprisonment for a term which may extend to two years, or with fine, or with both.

31. A Telegraph officer shall be deemed a public servant within the meaning of sections 161, 162, 163, 164 and 165 of the Indian Penal Code; and in the definition of "legal remuneration" contained in the said section 161, the word "Government" shall, for the purposes of this Act, be deemed to include a person licensed under this Act.

32. Whoever attempts to commit any offence punishable under this Act shall be punished with the punishment herein provided for the offence.

PART V.—SUPPLEMENTAL PROVISIONS.

33. (1) Whenever it appears to the Local Government that any act causing or likely to cause wrongful damage to any telegraph is repeatedly and maliciously committed in any place, and that the employment of an additional Police force in that place is thereby rendered necessary, the local Government may send such additional Police force as it thinks fit to the place and employ the same therein so long as in the opinion of that Government the necessity of doing so continues.

(2) The inhabitants of the place shall be charged with the cost of the additional Police force, and the District Magistrate shall, subject to the orders of the Local Government, assess the proportion in which the cost shall be paid by the inhabitants according to his judgment of their respective means.

(3) All moneys payable under sub-section (2) shall be recoverable either under the warrant of a Magistrate by distress and sale of the movable property of the defaulter within the local limits of his jurisdiction, or by suit in any competent Court.

(4) The Local Government may by order in writing define the limits of any place for the purposes of this section.

34* (1) This Act, in its application to the Presidency-towns, shall be read as if the words, "District Magistrate" in section 16, sub-section (1), and section 17, sub-sections (2) and (3), for the words "Magistrate of the first or second class" in section 18, sub-section (1), and section 19A, sub-section (2) and for the word "Magistrate" in section 18, sub-section (2), there had been enacted the words "Commissioner of Police," and for the words "District Judge" in section 16, sub-sections (3), (4) and (5), the words "Chief Judge of the Court of Small Causes."

(2) Section 16, in its application to the town of Rangoon, shall be read as if for the words "District Judge," wherever they occur in that section, there had been enacted the word "Judge of the Court of Small Causes."

(3) The fee in respect of an application to the Chief Judge of a Presidency Court of small Causes under sub-section (3) of section 16 shall be the same as would be payable under the Court-fees Act, 1870, in respect of such an application to a District Judge beyond the limits of a Presidency-town, and fees for summonses and other processes in proceedings before the Chief Judge under sub-section (3) or sub-section (4) of that section shall be payable according to the scale set forth in the fourth schedule to the Presidency Small Cause Courts Act, 1882.

NOTIFICATIONS UNDER THE SEA
CUSTOMS ACT, 1878.IMPORTATION OF APPARATUS FOR WIRELESS
TELEGRAPHS INTO BRITISH INDIA.

The bringing by sea or land into British India of any apparatus for wireless telegraphs is restricted by Notifications of the Government of India in the Department of Commerce, No. 6081 of the 22nd October, 1921, Finance Department (Customs) No. 775, of 29th March, 1924, and No. 1230 of 25th April, 1924, to cases in which:—

(1) Such apparatus is imported by any person to whom a licence to establish, main-

tain and work a wireless telegraph has been granted under the first proviso to sub-section (1) of section 4 of the Indian Telegraph Act, 1885 (XIII of 1885); or

(2) A licence to import such apparatus has been granted by the Director-General of Posts and Telegraphs. [See F.]

FINANCE DEPARTMENT (CUSTOMS) NOTIFICATION
No. 245, DATED THE 19TH MAY, 1923.

In exercise of the power conferred by section 23 of the Sea Customs Act, 1878 (VIII of 1878), the Governor-General in Council is pleased to exempt apparatus for wireless telegraphs imported in accordance with the terms of the notification of the Government of India in the Department of Commerce No. 6081, dated the 22nd October, 1921, from so much of the import duty leviable thereon under the Indian Tariff Act, 1894 (VIII of 1894), as is in excess of 2½ per cent. *ad valorem*.

RULES FOR THE CONDUCT OF WIRELESS
TELEGRAPHS.LICENSED UNDER THE INDIAN TELEGRAPH ACTS,
1885-1914.

(*Indian Wireless Telegraphs Rules, 1921.*)

POWER OF TELEGRAPH AUTHORITY TO GRANT
LICENCES.GOVERNMENT OF INDIA.—PUBLIC WORKS
DEPARTMENT. No. 23 P.W.

Notification.—Telegraphs.

Delhi, the 14th January, 1922.

C In exercise of the powers conferred by sub-section (2) of section 4 of the Indian Telegraph Act, 1885 (XIII of 1885), and in supersession of the notification of the Government of India in the Department of Commerce and Industry, No. 4837-88, dated the 20th June, 1914, the Governor-General in Council is pleased to delegate to the telegraph authority the power to grant a licence to establish maintain or work a telegraph within any part of British India: Provided that every such licence shall be subject to the following conditions, namely:—

(1) That the telegraph shall be used solely for the transmission of unpaid messages relating to the business of the licence and in the case of a wireless telegraph licensed for research, experimental or instructional purposes that the telegraph is solely used for such purposes:

(2) That the telegraph authority may at any time take possession of the telegraph should he consider it necessary; and

(3) That the licence shall be revocable on the breach of any of the conditions therein specified.

GOVERNMENT OF INDIA.—PUBLIC WORKS
DEPARTMENT. No. 24 P.W.

Notification.—Telegraphs.

Delhi, the 14th January, 1922.

In exercise of the powers conferred by section 7 of the Indian Telegraph Act, 1885 (XIII of 1885), and in supersession of the notification of the Government of India in the Department of Commerce and Industry No. 1984-P. & T., dated the 24th February, 1917, the Governor-General in Council is pleased to make the following rules regulating the conduct of wireless telegraphs established, maintained and worked by persons licensed under this Act:—

Short Title.—1. These rules may be called the Indian Wireless Telegraphs Rules, 1921.

Definitions.—2. In these rules, unless there is something repugnant in the subject or context—

*S. 34 was added by the Indian Telegraphs (Presidency Towns) Act, 1888 (XI of 1888), General Acts, Vol. IV.

(1) "Certificate of Competency" means a certificate of competency granted by the telegraph authority under these rules or by the proper authority in any British Possession or Protectorate entitling the holder to be employed as a wireless telegraph operator.

(2) "Convention" means the International Radiotelegraph Convention, dated the 5th July, 1912, and the Service Regulations made thereunder and includes any modification of the said Convention or Regulations made from time to time.

(3) "Harbour" includes harbours, whether natural or artificial, estuaries, navigable rivers, piers, jetties and other works in or at which ships can obtain shelter, or ship or unship goods or passengers.

(4) "Service Signalling" means signalling by means of any system of wireless telegraph between any fixed or mobile stations of His Majesty's Imperial, Dominion or Indian Naval Military or Air Force.

3. *Working of wireless telegraphs in ships within Indian territorial waters.*—Except with the general or special permission in writing of the telegraph authority no person shall work or use a wireless telegraph in any ship (other than a British ship-of-war) whilst the ship is in any harbour in India.

Provided that a wireless telegraph may be worked and used in ships which are underweigh in the Hoogli River below Garden Reach or in the Rangoon River for the sole purpose of exchanging messages with Calcutta Radio or Rangoon Radio respectively. [G. of I. (Department of Industries and Labour) Notification No. 168-P.T. of 12th June, 1924.]

4. No person shall send any message by means of the wireless telegraph in any ship (other than a British ship-of-war) whilst the ship is within Indian territorial waters when and where such messages can be forwarded by a Government telegraph.

5. No person shall work or use the wireless telegraph in any ship whilst the ship is within Indian territorial waters in such a way as to interrupt or interfere with service signalling or the transmission of messages between other wireless stations.

6. When communications are made by wireless telegraph between any ship within Indian territorial waters and a land station the rules given in the handbook, "General Rules and Departmental Instructions for Radiotelegraph Stations in India," shall be observed.

7. Nothing in these rules shall apply to the use of wireless telegraphs within Indian territorial waters for the purpose of making or answering signals of distress.

8. *Working of wireless telegraphs in aircraft over British India or over Indian territorial waters.*—Except with the general or special permission in writing of the Telegraph authority no person shall work or use a wireless telegraph in any aircraft (other than one of the Royal Air Force) whilst the aircraft is over British India or over Indian territorial waters, except in accordance with the following restrictions:—

(a) The wireless apparatus shall not be used except during actual flight or in case of forced landing;

(b) It may be used for receiving messages on any subject, but shall be used only for sending messages on the following subjects:—

- (i) Distress signals;
- (ii) Meteorological information;
- (iii) Forced landings and landing instructions;
- (iv) Ascertaining or indicating position;
- (v) Supply of fuel and spare parts;

(vi) Origin, destination or course of flight;

(c) The Aircraft Normal Wave (900 metres continuous wave) and no other wave shall be employed for the sending and receipt of messages to and from—

(i) Other aircraft stations;

(ii) Aviation stations;

(d) The aircraft Ship Wave (600 metres interrupted continuous wave) and no other wave shall be employed for the sending and receipt of—

(i) Messages to and from British Ships-of-war and all merchant ships;

(ii) Such messages as are rendered necessary by reason of exceptional emergency and do not come within the scope of the above-mentioned provisions for the use of the Aircraft Normal Wave;

(e) The rules given in the handbook "General Rules and Departmental Instructions for Radiotelegraph Stations in India" shall be observed;

(f) Service signalling or the transmission of messages between other wireless telegraph stations shall not be interfered with;

Provided that nothing in these restrictions shall apply to the use of wireless telegraphs for the purpose of making or answering signals of distress.

9. *Certificate of Competency.*—No person shall work the transmitting apparatus of a wireless telegraph in British India or in any ship or aircraft registered in British India unless he is a British subject or the subject of a State in India and holds a certificate of competency.

10. Certificates of competency shall be granted by the Telegraph authority subject to an examination, shall be in forms set out in the First and Second Schedules annexed hereto, shall indicate the system or systems in which the holder's examination was conducted, and shall certify that the holder—

(a) Is able to send and receive, by sound, messages in plain language in the International Morse Code and to send and receive speech clearly by wireless telephone apparatus, the speed at which Morse is to be sent and received being as follows (five letters being counted as one word):—

(i) *First Class.*—Not less than 20 words per minute.

(ii) *Second Class.*—12 to 19 words per minute.

(iii) *Third Class.*—Not less than 10 words per minute;

(b) Is able to adjust the apparatus ordinarily used so as to suit the varying conditions of working without using excessive power;

(c) Has an efficient working knowledge of the regulations applicable to the exchange of radiotelegraphic traffic.

11. Applications for permission to attend examinations for a certificate of competency shall be made to the Telegraph authority in the form shown in the Third Schedule to these rules. The date and place of examination will be notified to the candidate as soon as possible after the receipt of the application.

12. No person shall be eligible to attend an examination for a certificate of competency who is not a British subject, or the subject of a State in India.

13. Candidates for examination for first class certificates must be not less than 18 years of age.

14. The application form shall be forwarded to the examining officer by the Telegraph authority before the examination takes place.

15. Candidates for examination shall pay an examination fee of five rupees by means of postage stamps affixed to the application form.

16. *Scope of Examination.*—Candidates at an examination will be expected to—

(a) Send with an ordinary Morse key for five consecutive minutes at the prescribed speed. Accuracy and spacing will be taken into consideration;

(b) Receive and write down legibly for five consecutive minutes at the prescribed speed. A double headgear telephone receiver will be used for reception;

(c) Understand simple diagrams of the apparatus in which he is being examined and to make such diagrams from such apparatus

(d) Be able to connect up the apparatus; with the help of such diagrams so far as this is required in the system in which he is being examined;

(e) Name the parts of the apparatus and indicate their uses;

(f) Recognise, detect and remedy common faults in the apparatus;

(g) Adjust the apparatus as regards wavelength;

(h) Adjust the apparatus as regards power and generally regulate the transmitting gear and adjust the receiving gear;

(i) Answer questions on the method of handling radiotelegraph traffic as set out in the handbook issued by the telegraph authority (*General Rules and Departmental Instructions for Radiotelegraph Stations in India*) and the Service Regulations attached to the Convention.

(j) Have a good working knowledge of secondary batteries and be able to identify the positive source of supply preparatory to placing a secondary battery on charge, and also to be able to place a secondary battery on charge or on discharge at its normal rate through a water resistance.

17. *Declaration to observe secrecy.*—If the candidate passes the examination he shall make a declaration before the examining officer that he will observe the secrecy of correspondence which comes to his knowledge in the course of duty.

18. (1) *Photograph of Candidate.*—A candidate presenting himself for examination shall provide an unmounted photograph (approximately 2 ins. by 3 ins.). This will be checked by the examining officer.

(2) If the candidate is successful in the examination he will sign the photograph in the presence of the examining officer. The examining officer will attach it to the candidate's application form, and return both to the telegraph authority.

(3) The photograph will be affixed to the back of the certificate of competency in the office of the telegraph authority and stamped with a special date stamp overlapping photograph and certificate.

(4) The certificate will be completed and sent to the candidate by post.

19. *Failure.*—In case of failure at an examination the candidate will not be re-examined until after the lapse of three months. An additional fee of five rupees shall be payable in respect of such re-examination.

20. (1) *Power of the telegraph authority to endorse, suspend or cancel certificate.*—Should the holder of a certificate of competency be proved to the satisfaction of the Telegraph authority wilfully or negligently to have failed to comply with the provisions of the Convention or any

other regulations which may be issued from time to time for his guidance the Telegraph authority may endorse, suspend or cancel the certificate.

(2) The Telegraph authority may require the holder of a certificate of competency to produce the same for action under sub-rule (1), and the holder shall comply with such requisition.

FIRST SCHEDULE.

(See Rule 10.)

CERTIFICATE OF COMPETENCY AS WIRELESS OPERATOR.

1st and 2nd Class.—Wireless Telegraphs (including Telephone).

This is to certify that under the provisions of the Radiotelegraph Convention, 1912, Mr. _____ has been examined in radiotelegraphy and has passed in:—

(a) The working and adjustment of apparatus.

(b) Transmission and sound reading (Morse Code) at a speed of not less than _____ words per minute, and transmission and reception of speech.

(c) Knowledge of the regulations applicable to the exchange of radiotelegraph traffic.

2. The holder's practical knowledge was tested on a _____ set of apparatus.*

His knowledge of other systems is as follows:—

3. It is also certified hereby that the holder has made a declaration that he will preserve the secrecy of correspondence.

Signature of Examining Officer

Date _____ 192

The holder of this certificate is therefore authorised to operate radiotelegraph apparatus as a _____ class operator.

Signature.

Director-General of Posts and Telegraphs, India.

Date _____ 192

Signature of Holder

Date of Birth _____

Place of Birth _____

Description and Photograph of Holder,

Height _____ feet inches.

Colour of eyes.

Colour of hair.

Complexion.

Any special peculiarities or marks.

N.B.—This certificate may be endorsed, suspended or cancelled at the discretion of the Director-General of Posts and Telegraphs, in the case of misconduct or breach of the regulations on the part of the holder.

Two rupees will be charged for each duplicate copy of this certificate in cases in which the loss is due to unavoidable accident. In all other cases the following charges will be made for duplicate copies of this certificate:—

Four rupees on the first occasion.

Eight rupees on the second occasion.

Sixteen rupees on the third or subsequent occasions.

In cases of gross carelessness the question of withholding the issue of a duplicate copy of this certificate will be considered.

SECOND SCHEDULE.

(See Rule 10.)

CERTIFICATE OF COMPETENCY AS WIRELESS OPERATOR.

3rd Class.—Wireless Telephone.

This is to certify that Mr. _____ has been examined in radiotelegraphy and has passed in:—

(a) The working and adjustment of apparatus.

(b) Transmission and sound reading (Morse Code) at a speed of not less than ten words per minute, and transmission and reception of speech.

(c) Knowledge of the regulations applicable to the exchange of radiotelegraph traffic.

2. The holder's practical knowledge was tested on a set of apparatus.*

His knowledge of other systems is as follows:—

3. It is also certified hereby that the holder has made a declaration that he will preserve the secrecy of correspondence.

Signature of Examining Officer

Date 192

The holder of this certificate is therefore authorised to operate radiotelegraph apparatus as a third class operator.

Signature

Director-General of Posts and Telegraphs, India.

Date 192

Signature of Holder.

Date of Birth. *Place of Birth.*

Description and Photograph of Holder.

Height feet inches.

Colour of eyes.

Colour of hair.

Complexion.

Any special peculiarities or marks.

N.B.—This certificate may be endorsed, suspended or cancelled at the discretion of the Director-General of Posts and Telegraphs, in the case of misconduct or breach of the regulations on the part of holder.

Two rupees will be charged for each duplicate copy of this certificate in cases in which the loss is due to unavoidable accident. In all other cases the following charges will be made for duplicate copies of this certificate:—

Four rupees on the first occasion.

Eight rupees on the second occasion.

Sixteen rupees on the third or subsequent occasions.

In cases of gross carelessness the question of withholding the issue of a duplicate copy of this certificate will be considered.

THIRD SCHEDULE.

(See Rule II.)

APPLICATION TO ATTEND EXAMINATION FOR CERTIFICATE OF COMPETENCY AS WIRELESS OPERATOR.

(Postage stamps or stamp to the value of five rupees to be affixed here.)

To
THE DIRECTOR-GENERAL OF POSTS AND
TELEGRAPHS,
(Wireless Branch), INDIA.

Sir,—I beg to inform you that I wish to obtain a certificate qualifying me to act as Wireless Telegraph Operator. I declare that I am a British subject or subject of a State in India.

I am, Sir,

Your obedient servant,

Signature

Date 192

Name in full.

Date of Birth. *Place of Birth.*

Address to which it is desired that the order for examination shall be sent

System or systems in which examination is desired*

Place at which the candidate would prefer to be examined*.

Description of Candidate.

Height. feet inches.

Colour of eyes.

Colour of hair.

Complexion.

Any special peculiarities or marks.

RULES FOR THE CONDUCT OF WIRELESS TELEGRAPHS.

WHEN EMPLOYED FOR PUBLIC CORRESPONDENCE BETWEEN COAST STATIONS IN BRITISH INDIA AND SHIPS AT SEA.

GOVERNMENT OF INDIA.—PUBLIC WORKS DEPARTMENT.—No. 1386—P.W.

Notifications.—Telegraphs.

Simla, the 22nd July, 1922.

No. 1386-P.W.—In exercise of the powers conferred by section 7 of the Indian Telegraph Act, 1885 (XIII of 1885), and in supersession of the Notification of the Government of India in the Department of Commerce and Industry, No. 10054-87, dated the 29th November, 1913, the Governor-General in Council is pleased to issue the following rules governing the exchange by radiotelegraph of public correspondence between coast stations in British India and ships.

DURATION OF SERVICE.

1. The service at coast stations in British India will be in accordance with the hours notified for such stations in the "International List of Radiotelegraph Stations."

FORM AND ACCEPTANCE OF TELEGRAMS.

2. The form and acceptance of telegrams will be in accordance with the rules for Foreign telegrams as given in the rules published in the Notification of the Government of India in the Department of Commerce and Industry, No. 6975-137 dated the 16th September, 1919.

SPECIAL RULES FOR RADIOTELEGRAMS.

3. The sender is in every case responsible for the sufficiency and accuracy of the address of his radiotelegram.

4. (i) The address of radiotelegrams intended for ships should be drawn up as follows:—

(i) Name or description of addressee, with supplementary particulars, if necessary.

(ii) Name of the ship as in the first column of the "International List of Radiotelegraph Stations"; and,

(iii) If intended to be transmitted through a coast station, the name of the coast station as it appears in the "International List of Radiotelegraph Stations."

(2) If desired, the name of the ship may, at the risk of the sender, be replaced by the particulars of its voyage.

5. In the case of radiotelegrams accepted on board ship for places on land it is the duty of the operator to see that the office of destination

*Every endeavour will be made to meet the convenience of candidates in this respect, but no assurance can be given that the examination will be held at the place specified.

A candidate presenting himself for examination shall provide an unmounted photograph (approximately 2 ins. by 3 ins.) before his examinations. This will be checked by the Examining Officer.

*It is not intended to limit the employment of the holder to a particular system, but merely to indicate the particular system in which he was tested for adjustment of apparatus.

is written as shown in the first column of the "International List of Telegraph Offices."

SPECIAL RULES FOR RADIOTELEGRAMS.

6. The name and permanent address of the sender of a radiotelegram should be written on the form for purposes of record.

PREAMBLE.

7. The preamble of every radiotelegram will begin with the word "Radio."

8. On transmitting a radiotelegram from a ship over the ordinary telegraph system, the coast station will insert for "office of origin" the name of the ship of origin as it appears in the "International List of Radiotelegraph Stations," and also, when the case arises, the name of the last ship which acted as intermediary, should any re-transmission have occurred, and the name of the coast station. The code time (*i.e.*, the time of receipt of the radiotelegram at the coast station) will also be inserted, and this, together with the service instructions, the date and time of handing in, and the number of words signalled by the ship will be transmitted.

CHARGES FOR RADIOTELEGRAMS.

9. The charge for a radiotelegram must in every case be prepaid by the sender.

10. The coast station charge and the ship station charge are notified in the "International List of Radiotelegraph Stations"; and such charges as are fixed from time to time as far as British India is concerned, are published in the Post and Telegraph Guide.

RADIOTELEGRAMS FOR DELIVERY BY POST FROM A PORT OF CALL OF THE SHIP TO WHICH THEY ARE TRANSMITTED.

11. (1) Radiotelegrams may be accepted for a ship with the object of being forwarded by post from a port of call. Re-transmission by radiotelegraphy is not permitted in such cases.

(2) The address must be drawn up as follows:

(a) The paid instruction "Poste" followed by the name of the port where the radiotelegram is to be posted.

(b) Name and address of the addressee.

(c) Name of the ship station which is to carry out the posting.

(d) Name of the coast station in communication with the ship, unless the message is exchanged directly between two ships.

Example:—

"= Poste Bombay = Smith 14 The Mall Poona Mantua Karachi Radio."

(3) A charge for postage equivalent to 25 gold centimes at the rate of exchange from time to time fixed by the Governor-General in Council shall be payable by the sender in addition to the radiotelegraph charges.

(4) A radiotelegram of this nature received on board a ship will be posted as a paid letter at the port indicated and particulars of posting noted on the duplicate form.

CLASSES OF TELEGRAMS NOT ADMITTED IN THE RADIOTELEGRAPHIC SERVICE.

12. Certain special classes of telegrams, which are admitted in the international telegraph service, cannot be accepted in the radiotelegraphic service. They are as follows:—

(a) Telegraphic money orders.

(b) Telegrams "to follow the addressee."

(c) Paid service telegrams asking for repetition of information, except as regards transmission over the ordinary telegraph system.

(d) Urgent telegrams, except as regards transmission over the telegraph system of

Administrations which accept such telegrams.

(e) Telegrams at deferred rates.

PRIORITY OF MESSAGES.

13. Subject to the proviso that signals of distress shall take precedence over all other messages, radiotelegrams shall be transmitted in the order given in Rule 158 of the rules published in the Notification of the Government of India in the Department of Commerce and Industry, No. 6975-137, dated the 16th September, 1909, viz.:—

(a) State (or Government) telegrams.

(b) Service telegrams.

(c) Private telegrams.

(d) Press telegrams.

UNDELIVERED RADIOTELEGRAMS FROM SHIPS.

14. When a radiotelegram from a ship at sea cannot be delivered to the addressee on land, the fact, with the reason assigned for the non-delivery, will be communicated to the ship for the information of the sender. If the sender is desirous of altering or adding to an address, he may do so by means of a paid service advice.

UNDELIVERED RADIOTELEGRAMS ADDRESSED TO SHIPS.

15. When a radiotelegram reaching a ship at sea cannot be delivered, the office or ship station of origin will be informed by service advice.

16. (1) The sender of a radiotelegram to a ship may indicate the maximum period for which he desires the message to be kept at the coast station.

(2) If the sender does not specify any period, the office of origin will be informed by service advice on the morning of the 8th day after the despatch of the radiotelegram that it has not been possible to deliver the message to the ship of destination. The sender, who will be informed by the office of origin, may then, if he chooses, request, by means of a paid service advice to the coast station (the prepayment being at the rate for a message to the coast station, without payment of the wireless rate either for the coast station or for the ship), that the radiotelegram may be retained for a further period of 9 days, and so on. If no such request is received, the radiotelegram shall be treated as undeliverable at the end of the 9th day, not including the day of handing in.

(3) If the coast station knows that the ship has passed beyond its range of transmission before the radiotelegram could be transmitted to it, the office of origin shall be informed accordingly by service advice without delay for intimation to the sender, who may then, by paid service advice, request the coast station to transmit the radiotelegram when the ship next passes.

MESSAGE FORMS TO BE PRESERVED.

17. The originals of radiotelegrams and the documents relating to them shall be kept for seven days only in Government telegraph and radiotelegraph offices, after which they shall be sent to the Deputy Accountant-General, Telegraph Check Office, Calcutta, where they shall be preserved for at least fifteen months, reckoned from the month following that of handing in.

REFUNDS.

18. Refunds shall be governed by Rules 348 to 358 of the rules published in the Notification of the Government of India in the Department of Commerce and Industry, No. 6975-137, dated the 16th September, 1909, subject to the following conditions:—

(a) No refund shall be granted in respect of any radiotelegram inadmissible under Rule 12 of these rules;

(b) The time occupied in radiotelegraphic transmission, and also the time during which the radiotelegram remains at the coast station in the case of radiotelegrams addressed to ships, or in the ship station in the case of radiotelegrams originating in ships, shall not be counted in the period of delay giving rise to refunds and reimbursements.

(c) If the coast station informs the office of origin that a radiotelegram cannot be transmitted to the ship to which it is addressed, the coast station and ship station charges in respect of such radiotelegram shall be refunded to the sender.

EXTRACTS FROM THE INDIAN MERCHANT SHIPPING ACT, 1923,

AND NOTIFICATIONS.

(ACT No. XXI OF 1923*)

D An Act to consolidate certain enactments relating to Merchant Shipping. Whereas it is expedient to consolidate certain enactments relating to Merchant Shipping, it is hereby enacted as follows:—

PART I.

INTRODUCTORY.

1. (1) This Act may be called the Indian Merchant Shipping Act, 1923.

(2) It shall come into force on such date as the Governor-General in Council may, by notification in the *Gazette of India*, appoint.

2. *Definitions*.—In this Act, unless there is anything repugnant in the subject or context,—

(4) “Master” includes every person (except a pilot or harbour master) having command or charge of a ship;

(6) “Passenger” includes any person carried in a ship other than the master and crew and the owner, his family and servants;

(7) “Prescribed” means prescribed by rules made under this Act;

(9) “Steam-ship” means every description of vessel used in navigation and propelled wholly or partly by the agency of steam;

3. The provisions of this Act applying to steamships shall apply to ships propelled by electricity or other mechanical power, with such modifications as the Governor-General in Council may, by notification in the *Gazette of India*, direct for the purpose of adaptation.

4. This Act shall not, except where specially provided, apply to ships belonging to His Majesty or the Government, or to ships belonging to any foreign Prince or State and employed otherwise than for profit in the public service of that foreign Prince or State.

PART V.

SAFETY.

INSTALLATION OF WIRELESS TELEGRAPHY.

240. The provisions of this Part in regard to the installation of wireless telegraphy on ships registered in British India shall come into force on such date as the Governor-General in Council may, by notification in the *Gazette of India*, direct.

241. In the provisions of this Part relating to the installation of wireless telegraphy, “passenger steamer” means a steamship which carries more than twelve passengers.

242. (1) Every sea-going British ship registered in British India, being a passenger steamer

or a ship of 1,600 tons gross tonnage or upwards shall be provided with a wireless telegraph installation of the prescribed description and shall maintain a wireless telegraph service of the prescribed nature and shall be provided with such certificated operators and watchers as may be prescribed.

Provided that the Governor-General in Council may, by notification in the *Gazette of India*, exempt from the obligations imposed by this Section any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph installation is unnecessary or unreasonable.

(2) If this section is not complied with in the case of any such ship, the master or owner of the ship shall be punishable in respect of each offence with a fine which may extend to one thousand rupees.

243. (1) The Governor-General in Council may appoint officers (hereinafter referred to as wireless telegraphy inspectors) for the purpose of seeing that the requirements of this Part relating to wireless telegraphy are complied with on board any ship.

(2) A wireless telegraphy inspector may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certificated operators and watchers in conformity with this Part and for this purpose may go on board any ship at all reasonable times and do all things necessary for the proper inspection of the ship for the purpose of this Part and may also require the master of the ship to supply him with any information which it is in the power of the master to supply for that purpose, including the production of any certificate granted under this Part in respect of the installation, and of the certificates of the operators and watchers on the ship.

(3) If a wireless telegraphy inspector finds that a ship is not provided, he shall give to the master or owner notice in writing pointing out the deficiency; and also pointing out what in his opinion is requisite to remedy the same.

(4) Every notice given under sub-section (3) shall be communicated, in the prescribed manner, to the Chief Officer of Customs of any port at which the ship may seek to obtain port-clearance, who shall order that the ship shall be detained until a certificate under the hand of a wireless telegraphy inspector is produced to the effect that the ship is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Part.

244. The provisions of this Part relating to wireless telegraphy shall, as from a date three months after the coming into force of those provisions, apply to ships other than British ships registered in British India while they are within any port in British India in like manner as they apply to British ships registered in British India.

245. (1) The Governor-General in Council may make rules to carry out the purposes of this Part relating to wireless telegraphy.

(2) In particular and without prejudice to the generality of the foregoing power such rules may prescribe—

(a) The nature of the wireless telegraph installation to be provided and of the service to be maintained, and the number, grades and qualifications of certified operators and watchers to be carried;

Provided that no ship shall be required to carry more than one operator, unless more than one operator would have been required

*This Act repeals the Indian Wireless Telegraphy (Shipping) Act, 1920 (XLI of 1920).

under the provisions of the Merchant Shipping (Convention) Act, 1914 :

(b) The manner in which a notice given under sub-section (3) of section 243 shall be communicated to the Chief Officer of Customs.

* * * * *

PART VIII. LEGAL PROCEEDINGS.

280. The following persons shall be deemed to be public servants within the meaning of the Indian Penal Code, namely :—

* * * * *

(f) Every Wireless Telegraphy Inspector appointed under this Act.

* * * * *

PART IX. SUPPLEMENTAL.

* * * * *

294. All rules made under this Act shall be published in the *Gazette of India* or the local official *Gazette*, as the case may be, and such publication shall have effect as if in this Act.

295. No suit or other legal proceeding shall lie against any person for anything which is in good faith done or intended to be done under this Act.

GOVERNMENT OF INDIA.—DEPARTMENT OF COMMERCE.

NOTIFICATIONS.—MERCHANT SHIPPING.

Simla, the 5th May, 1923.

No. 2743.—In pursuance of section 240 of the Indian Merchant Shipping Act, 1923 (XXI of 1923), the Governor-General in Council is pleased to direct that the provisions of sections 241 to 245 of the said Act shall come into force on the 5th May, 1923.

No. 2744.—In exercise of the power conferred by the proviso to sub-section (1) of section 242 of the Indian Merchant Shipping Act, 1923, the Governor-General in Council is pleased to exempt from the obligations imposed by the said Act *all ships engaged in the coasting trade except ships engaged in the following runs, namely :—*

- (1) Calcutta to Rangoon.
- (2) " " Port Blair.
- (3) " " Penang.
- (4) " " Colombo.
- (5) Madras ports to Rangoon.
- (6) " " Port Blair.
- (7) " " Penang.
- (8) Rangoon to Calcutta.
- (9) " " Port Blair.
- (10) " " Penang.
- (11) Bombay to Aden.
- (12) " " Karachi direct
- (13) Ports in British India to Singapore.

Explanation—"Coasting trade" means trade exclusively carried on between the ports specified in the definition of "home-trade ship" in section 2 of the Indian Merchant Shipping Act, 1923.

No. 2745.—In exercise of the power conferred by section 245 of the Indian Merchant Shipping Act, 1923 (XXI of 1923), the Governor-General in Council is pleased to make the following rules—

1. *Short title*.—These rules may be called the Indian Wireless Telegraphy (Shipping) Rules, 1923.

2. *Definition*.—In these rules, unless there is anything repugnant in the subject or context—

"Coasting trade" means trade exclusively carried on between the ports specified in the

definition of "home-trade ship" in section 2 of the Indian Merchant Shipping Act, 1923.

"Number of hours occupied in a voyage from port to port" means the normal number of hours occupied in a voyage between one port of call and the next. In the case of river ports the duration of the voyage shall count from pilot ground to pilot ground.

"The Act" means the Indian Merchant Shipping Act, 1923.

3. (1) *Classification of Ships*.—For the purpose of these rules ships shall be classified as follows :

Class I. Ships carrying 200 persons or more which are not engaged in the coasting trade.

Class II. Ships not engaged in the coasting trade carrying not less than 50 but less than 200 persons and ships engaged in the coasting trade carrying 50 persons or more.

Class III. Ships carrying less than 50 persons.

In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

(2) Where any doubt or dispute arises regarding the classification of a ship under this rule the Port Officer at the port where the doubt or dispute arises shall decide the question and his decision shall be final. [G. of I. (Department of Commerce), Notification No. 116-S. of 19th January, 1924.]

Clauses 4 to 10 are practically identical with Clauses 3 to 9 of the Merchant Shipping (Wireless Telegraphy) Rules of 1920, in force in Great Britain (see page 224), with the following exceptions :—

For Clause 5 (4) of the British Rules is substituted Clause 6 (4) in the Indian Rules, reading as follows :—

(4) At least once during each outward and homeward voyage the emergency installation shall be tested by the exchange of signals with another ship station or with a coast station. Particulars of such tests shall be entered in the log as they occur ; the entry shall also indicate the distance over which signals were exchanged together with remarks on the efficient working or otherwise of the installation.

In Clauses 9 and 10 of the Indian Rules (corresponding to Clauses 8 and 9 of the British Rules) the words "THE GOVERNOR-GENERAL IN COUNCIL" are substituted for "THE BOARD OF TRADE AND THE POSTMASTER-GENERAL."

11. *Qualifications of Operators*.—(1) Operators shall be granted First, Second or Third Grade certificates in accordance with general or special orders of the Governor-General in Council in this behalf, and watchers shall be certificated by the Director-General of Posts and Telegraphs.

(2) Until certificates are granted in accordance with such orders as aforesaid :—

(i) An operator who holds a First Class certificate of competency granted by the Director-General of Posts and Telegraphs and who has had three years' experience at sea as a commercial operator in a vessel of the mercantile marine may be employed as if he held a First Grade certificate, but if an operator holding a First Grade certificate is available an operator holding a First Class certificate shall not be so employed on a ship of Class I which is required by these rules to carry three operators.

(ii) An operator who holds a First or Second Class certificate of competency granted by the Director-General of Posts and Telegraphs and who has had one year's experience at sea as a commercial operator in a vessel of the mercantile marine may be employed as if he held a Second Grade certificate.

(iii) An operator who holds a First or Second Class certificate of competency granted by the Director-General of Posts and Telegraphs, and who has had less than one year's experience at sea as a commercial operator in a vessel of the mercantile marine may be employed as if he held a Third Grade certificate.

(3) For the purposes of sub-rule (2) experience as an operator in the Royal Navy or Royal Indian Marine or in seaplanes of the Royal Air Force may be accepted in substitution for experience at sea as a commercial operator in a vessel of the mercantile marine in respect of a period which for the purposes of Clause (i) of the said sub-rule shall not exceed two years and for the purposes of Clause (ii) and Clause (iii) of the said sub-rule shall not exceed six

months of the total period of experience required. [G. of I. (Department of Commerce), Notification No. 3563 of 28th June, 1923.]

12. *Discretion to accept certificates granted in other countries.*—A certificate granted to an operator by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force may be accepted for the purpose of these rules as equivalent to a certificate of such grade as the Director-General of Posts and Telegraphs may think fit by general or special order to direct.

13. *Manner in which notice should be given to the Chief Officer of Customs.*—The notice required to be given under sub-section 3 of section 243 of the Act shall be in the Form in Schedule B to these rules, and a copy of every such notice shall on the same day be forwarded by the Wireless Telegraphy Inspector issuing the notice to the Chief Officer of Customs at the port concerned.

SCHEDULE A.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.
See corresponding Schedule in the MERCHANT SHIPPING (WIRELESS TELEGRAPHY) RULES OF 1920, under Great Britain, page 226.

SCHEDULE B.

Captain Port of
Date

Sir,
An inspection made this day of the wireless telegraph installation on board the s.s. of which you are master, indicates that the equipment does not conform to the requirements of the Indian Merchant Shipping Act, 1923, and the licence issued by the Director-General, Posts and Telegraphs, in the following particulars.

I am of opinion that the following steps should be taken to remedy the deficiencies

Copies of this report have been forwarded to the Chief Officer of Customs at

Wireless Inspector.

INSTRUCTIONS GOVERNING LICENCES FOR WIRELESS TELEGRAPHS IN BRITISH INDIA.

Published by the Director-General of Posts and Telegraphs.

E I.—GENERAL INSTRUCTIONS.

Except in the case of wireless telegraphs owned or worked by Government, for which no licence is required, no person may :—

(a) import apparatus for wireless telegraphs by sea or land into British India ; or

(b) establish, maintain or work a wireless telegraph in any place in British India, or in any ship or aircraft registered in British India ;

except under a licence granted by the Director-General of Posts and Telegraphs.

2. Licences are framed and granted by the Director-General in such forms as are prescribed under the classification laid down in the following table :—

Form of Licence.	Type of Station.	Class.	Apparatus permitted.	Class of Operator required.	Purpose.
Import	—	—	T R M S	—	Importation of apparatus for wireless telegraphs into British India.
Mobile Stations {	Ship	I, II, III	T R M S	1st and 2nd(b)	Communication with land and other mobile stations.
	Aircraft ..	—	T R M S	1st and 2nd	
Fixed Stations* {	Limited Commercial	I	T R M S	2nd	Transmission and Reception for business purposes.
		II	T R S	3rd	
	Non-Commercial	III	R M S	Nil	Reception only for business purposes.
		I	T R M S	3rd	
Broadcast Receiver	—	III	T R (a)	Nil	Bona fide experimenters, experimental and instructional establishments and amateurs.
		—	R M S	Nil	

Reception only for other than business purposes.
[NOTE.—These stations were formerly licensed as Non-Commercial, Class II.]

T = Transmission. R = Reception. M = Morse. S = Speech.

(a) No antenna to be used.

(b) According to International Radio Telegraph Convention.

NOTE.—The term "Wireless Telegraphs" includes Wireless Telephony.

*Spark not permitted for Fixed Stations. Power normally limited to 100 watts.

II.—IMPORT, MOBILE STATIONS AND FIXED STATIONS LICENCES.

3. (1) The fee for these licences is Rs. 10 per annum in respect of each station licensed and for each import licence. The fee is payable before the licence is issued and the fee payable upon renewal is payable before such renewal.

(2) The fee should be paid by postage stamps affixed to the application form or application for renewal.

4. Before granting a licence the applicant may be required to furnish such particulars in addition to those set out on the application form as the Director-General shall desire.

5. (1) The application for renewal of a licence must be in writing and should state the registered numbers of the licence and schedule or schedules and the period for which a renewal is desired and should be accompanied by the signed original licence and the fee for the renewal [see clause 3 (1)].

(2) Applications for renewal must be forwarded so as to reach the Director-General by December 1st in each year.

6. These licences are valid for one year and expire on the 31st day of December of the year of issue, *unless* issued on or after the 1st day in November in any year, when they will remain valid until the 31st day of December in the following year.

7. (1) The bringing by sea or land into British India of any apparatus for wireless telegraphs is restricted by Notification of the Government of India under the Sea Customs Act, 1878 to cases in which:—

(a) such apparatus is imported by any person to whom a licence to establish, maintain and work a wireless telegraph has been granted under the Indian Telegraph Acts, 1885—1914; or

(b) a licence in the form set out in the First Schedule hereto has been granted by the Director-General of Posts and Telegraphs.

(2) Apparatus for wireless telegraphs imported in accordance with sub-clause (1) of this clause is exempt from so much of the import duty leviable thereon under the Indian Tariff Act, 1894 as is in excess of 2½ per cent. *ad valorem*.

(3) No application for an import licence will be considered by the Director-General unless the applicant furnishes satisfactory evidence as to character and the objects for which he requires a licence.

(4) An import licence does NOT authorise the licensee to establish, maintain or work a wireless telegraph in British India, but otherwise such licence imposes no restriction on the disposal of the imported apparatus.

(5) The form of import licence as set out in the First Schedule hereto may also be used as an application form for these licences.

8. (1) Sub-clause (3) of clause 7 above also applies to a mobile stations licence, the application form of which is set out in the Second Schedule hereto.

9. (1) No applications for fixed stations licences will be considered by the Director-General *unless they are accompanied by the approval of the Local Government of the Province in which it is proposed to install the licensed apparatus.*

(2) The Director-General will not grant a fixed stations licence unless he is satisfied:—

(a) That the applicant is not less than 21 years of age and has furnished satisfactory evidence as to character and the objects for which he requires a licence. Applications from *bona fide* experimenters, between the

ages of 16 and 21 will be considered if accompanied by a declaration from the head of the Educational Establishment attended by the applicant or from his legal guardian that the applicant is a fit and proper person interested in and competent to conduct experiments in wireless telegraphs.

(b) That the applicant has in view some definite object of scientific value or public utility. If research or experiment is intended the applicant should be certified by a Government Department or some recognised scientific body as a competent person to conduct such research or experiment.

(c) That the applicant can show that he is, or the persons he proposes to employ are, capable of working the apparatus for the objects for which he requires a licence.

(d) That if the apparatus is to be used for the transmission of messages or signals using an antenna, the applicant undertakes to employ in this work only certified operators of the number and class required.

(e) That the apparatus is capable of being worked in accordance with the provisions of the licence.

(3) In the case of LIMITED COMMERCIAL stations which employ power *exceeding 30 watts*, an annual royalty is payable for each station licensed as under:—

Mode of Communication	Licensed to work during 24 hours daily.	Licensed to work during 16 hours daily.	Licensed to work during 8 hours daily.
Telegraph only	Rs. 440	Rs. 300	Rs. 150
Telephony only, or Telegraphy and Telephony	550	370	190

The above royalties may be reduced at the discretion of the Director-General by an amount not exceeding 80 per cent. in the following cases:—

(a) stations erected outside the delivery radius of a Government Telegraph Office (usually 5 miles);

(b) stations erected for providing communications which are not calculated to detract from any revenue derived by the Department of Posts and Telegraphs.

No royalty is payable in respect of Limited Commercial stations employing power of 30 watts and below or in respect of Non-Commercial stations.

(4) The application form for a fixed stations licence is set out in the Third Schedule hereto.

III.—BROADCAST RECEIVER LICENCES.

NOTE.—(1) A Broadcast Receiver Station is one which is capable of receiving Morse and or speech but not capable of transmitting. The station must only be employed for the purposes of "*bona fide* experimenters, experimental and instructional establishments and amateurs." It may not be used for business purposes. No certified operators are required.

10. On and from the 1st August, 1924, a form of broadcast receiver licence for wireless sets or stations intended for reception only together with the necessary application forms will be available at the following Head Post Offices in British India:—

Allahabad ..	P.O.	Madras ..	G.P.O.
Bombay ..	G.P.O.	Nagpur ..	P.O.
Calcutta ..	G.P.O.	Patna ..	P.O.
Cawnpore ..	P.O.	Rangoon ..	P.O.
Delhi ..	P.O.	Rawalpindi ..	P.O.
Karachi ..	P.O.	Shillong ..	P.O.
Lahore ..	P.O.	Simla ..	P.O.
Lucknow ..	P.O.		

11. (1) A broadcast receiver licence is valid in any part of British India *except* Baluchistan and the North-West Frontier Province, irrespective of the locality of the Head Post Office from which it is issued. Applicants for licences in Baluchistan and the North-West Frontier Province should apply to the Director-General of Posts and Telegraphs (Wireless Branch), Simla.

(2) It is not valid *outside* British India (*e.g.*, in an Indian State).

(3) The licence is valid for 12 months from the first day of the month of issue, *i.e.*, if issued on any date in June, 1924 it will expire on the last day of May, 1925. The date of expiration in the case of second and subsequent years (providing the licence has been renewed) will be the anniversary of the date of expiration of the original licence which will, therefore, always be the last day of a month.

(4) On or before the date of expiry of a licence the licence must be renewed [see clause 13 (4) below].

12. The annual fee is Rs. 10 in respect of each licence.

PROCEDURE FOR OBTAINING OR RENEWING A LICENCE.

13. (1) Applications for licences or for renewals of expired licences should be made where possible in person at the *nearest* Head Post Office mentioned above. If personal application is impracticable, applications may be made in writing.

(2) The applicant must fill in and sign an application form (W.T.101).

(3) The applicant must make over the completed application form together with Rs. 10 in cash or postage stamps (being the annual fee for the licence), to the issuing Postmaster.

(4) When a Licensee requires to *renew* a licence he must fill in and sign an application form and make this over *together with the expired or expiring licence* and Rs. 10 in cash or postage stamps to the Postmaster at the *nearest* Head Post Office mentioned above.

(5) A separate application form is to be filled in for each station (or receiving set) for which a licence or renewal is required.

RECEIVING SETS FOR MOTOR CARS AND PORTABLE SETS.

14. Subject to the provisions of clause 11 above, these licences cover sets erected in motor cars and also portable sets which may be worked under the licence within a radius of 50 miles from the usual location of the station *or* from the Head Post Office from which the licence is issued. Applicants for licences wishing to avail themselves of any of the above facilities must indicate the same on the application form.

CHANGE OF ADDRESS OR LOCATION OF THE STATION.

15. Licensees are *required* to communicate any change in their address or any change in the location of the station to the Issuing Postmaster and when doing so must produce their licence.

LOST LICENCES.

16. If a licence is lost the fact must be communicated to the Issuing Postmaster without

delay indicating the registered number of the lost licence. At the same time application must be made for a *fresh* licence for which the full fee of Rs. 10 will be charged.

IV.—WIRELESS SETS IN MILITARY (REGULAR AND NON-REGULAR) UNITS.

The following regulations govern the erection, maintenance and working of wireless sets in military (regular and non-regular) units in British India:—

(a) Sets loaned to units by the military authorities will be maintained and worked under the same conditions as authorised military stations and need not be licensed.

(b) Sets which are the private property of a unit and only intended for use by the unit for military purposes need not be licensed but will be worked under the same conditions as other military stations.

(c) Sets which are the private property of a unit and intended for use for other than military purposes must be licensed by the Director-General of Posts and Telegraphs, India, in accordance with the rules under the Indian Telegraph Acts, 1885-1914 governing the erection, maintenance and working of licensed telegraphs in British India. The licence will provide that the fullest use can be made of the set for the purposes of the unit both as regards training, recreation and in emergency. Such sets will not be licensed to work with Government stations but may work with military stations by general or local arrangements, but while being so used they will conform to the conditions governing the operations of military stations in every respect.

(d) Sets which are the private property of individuals in units must be licensed by the Director-General of Posts and Telegraphs as in (c) above and may be employed for any purpose which the licence permits. If required the licence will also be framed to permit such sets being used as part of the equipment of the unit in which case while being so used they must conform to the conditions governing the operation of military stations in every respect.

2. Applications for licences are to be addressed to the Director-General of Posts and Telegraphs (Wireless Branch), Simla, through the Local Government of the province in which the set will be installed, and should indicate clearly the scope of licence required in accordance with the foregoing. In the case of sets which are the private property of a unit as in (c) above the application will be made by the Officer Commanding the unit and the licence will be issued to him.

3. In no case will sets licensed under (c) or (d) above be permitted to carry private traffic unless provided for in the terms of the licence. This may entail the payment of an annual royalty to the Department of Posts and Telegraphs.

4. The term "set" as used above includes wireless telegraphy and telephony whether for reception only or for reception and transmission.

FIRST SCHEDULE.

FORM OF IMPORT LICENCE.

(See F on page 287.)

SECOND SCHEDULE.

APPLICATION FORM FOR MOBILE STATIONS
LICENCE.

Application for licence to establish, maintain and work wireless telegraphs in Ships and Aircraft Registered in British India.

1. Names of Applicant (in full).....
Address
Age
Occupation
2. Particulars of Ship for which a licence is required:—Name.....Owners..... Port of Registry in British India.....
3. Particulars of Aircraft for which a licence is required:—Name and/or No. Type and Make..... Registered Marking.....Place of Registry in British India.....
4. Particulars of apparatus:—(a) Transmitting.....(b) Receiving.....(c) If Emergency set is installed.....
5. Power to be used for transmission (A).
(a) Source (B). (b) Point where measured.....
(c) Volts..... Amperes.....(d) D/C or A/C(e) Cycles per second (A/C)....
(f) Maximum watts to be taken by transmitting instruments
- (A) Power is defined in the case of valve transmission as the power in the anode circuit of the valve, in other cases as the power taken from the terminals of the main generators or equivalent point.
- (B) If batteries are used state kind, if secondary cells state capacity and maximum discharge rate, if dynamo state maximum power available and if supply mains state voltage (whether direct or alternating) and periodicity.
6. Wavelengths it is desired to use:—(a) Spark or interrupted Continuous Wave. (b) Continuous Wave.
7. Number and qualifications of Operators.
8. Class of Station under Radiotelegraph Convention, 1912.....
9. Nature of service to be performed
10. Hours of service.....
11. Name and address of person or persons by whom radiotelegraph accounts are settled

CERTIFICATE OF INSPECTION.

(To be completed by a competent Wireless Telegraph Engineer.)

I hereby certify that I have inspected the installation described in this application and that the particulars given are correct.

Signature
Occupation
Address

Date.....192 ..

DECLARATION.

I undertake to observe the conditions of the licence and hereby certify that the apparatus herein described can and will be worked in accordance with the provisions of the licence. I further declare that only operators holding certificates of competency shall be employed to work the transmitting apparatus.

Signature of Applicant
Date192 ..

This application, when completed, should be forwarded to the Director-General of Posts and Telegraphs (Wireless Branch), Simla.

Postage
Stamps

THIRD SCHEDULE.

APPLICATION FORM FOR FIXED STATIONS
LICENCE.

Application for licence to establish, maintain and work wireless telegraphs in British India.

1. Names of Applicant (in full).....
Address
Age
Occupation
Nationality. (Evidence of nationality and two written references as to character should be enclosed.)
2. Scientific qualifications (if any) of applicant. Particulars of any experience in working wireless telegraph transmitting apparatus. Particulars of any certificates of competency held by applicant.
Speed at which applicant can send and receive in the Morse code.
3. Purpose for which a licence is required.
4. *Particulars of apparatus to be used. The trade name of the set in the case of a standard set bearing a recognised trade name. (Diagrams to be furnished and attached to this form unless a standard set bearing a recognised trade name is to be employed.)
(a) Transmitting—(b) Receiving—(c) Antenna—
(including sketch and dimensions and means of support).
5. *Power to be used for transmission (A).
(a) Source (B).....
(b) Point where measured
(c) Volts Amperes
(d) D/C or A/C (e) Cycles per second (A/C)
(f) Maximum watts to be taken by transmitting instruments
- (A) Power is defined in the case of valve transmission as the power in the anode circuit of the valve, in other cases as the power taken from the terminals of the main generators or equivalent point.
- (B) If batteries are used state kind, if secondary cells state capacity and maximum discharge rate, if dynamo state maximum power available and if supply main state voltage (whether direct) or alternating and periodicity.
6. Particulars of stations:—Name..... exact Location (a).....Type (b)..... Class (b) Remarks.....
- NOTES.—(a) If station is to be moveable state place in which it will normally be located and area over which it is desired to move.
(b) For "Type" and "Class" see Table on page 1.
7. *Wavelengths it is desired to use:—
Transmitting.—Normal.....Metres.
Additional..... "
Receiving.— Normal "
Additional "
8. *Range of waves over which apparatus is capable of being adjusted:—
Transmitting Metres.
Receiving "
9. *Stations with which it is desired to communicate
10. *What messages from Government stations is it desired to read and make use of?
11. *Hours of working desired (I.S.T.):—
Transmitting
Receiving
12. If the station or stations are intended to transmit, state names, addresses and qualifications of operators.

*If more than one station is desired, details must be given for each station.

DECLARATION.

I undertake to observe the conditions of the licence and hereby certify that the apparatus herein described can and will be worked in accordance with the provisions of the licence. I further declare that if the apparatus is licensed for the transmission of messages, only operators holding certificates of competency shall be employed to work the transmitting apparatus.

Signature of Applicant
Date.....192 .

This application, when completed, should be forwarded to the Director-General of Posts and Telegraphs (Wireless) Branch, Simla, through the Local Government of the Province in which the station will be located.

Postage
Stamps

IMPORT (WIRELESS TELEGRAPHS)
LICENCE.

F Registered No.
Dated 192 .
TELEGRAPHS.

*Licence to Import Apparatus for Wireless
Telegraphs into British India.*

1. In exercise of the power given him by Notification No. 6081, dated Simla, the 22nd October, 1921, issued under section 19 of the Indian Sea Customs Act, 1878 (VIII of 1878), and in exercise of all powers and authorities enabling him in this behalf, the Director-General of Posts and Telegraphs in India (hereinafter called the Director-General) hereby grants to

of
(hereinafter called the licensee), during the term or period commencing on the day of the date hereof, and terminating on the 31st day of December, 192 , when the licence expires and becomes invalid unless renewed by endorsement thereon under the hand of the Director-General, licence and permission to import such apparatus for wireless telegraphs (hereinafter called the licensed apparatus) as is specified in the schedule annexed hereto, or as may be specified in any supplemental licence given from time to time under the hand of the Director-General.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council.

in the presence of

The day of 192 .
Signed by the licensee
in the presence of
The day of 192 .

SCHEDULE No. Annexed to
Import (Wireless Telegraphs) Licence, Registered
No. Dated 192 .

1. Name of licensee.
2. Address of licensee
3. Places at which licensed apparatus may be imported.
4. Description of licensed apparatus to be imported.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council
in the presence of
The day of 192 .

FIXED STATIONS LICENCE.

G Registered No.
Dated 192 .

TELEGRAPHS.

LICENCE TO ESTABLISH, MAINTAIN AND WORK
WIRELESS TELEGRAPHS IN BRITISH INDIA.

INTERPRETATION CLAUSE.

1. (1) In these presents (and in the schedule annexed hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say)—

(2) "Station" means any apparatus for wireless telegraphs erected for the purpose of transmitting or receiving messages or signals, whether with or without antenna.

"Fixed stations" means stations established on land (or on board any ship permanently moored).

"Land stations" means fixed stations established for service with mobile stations, the town being used only in respect of their service with mobile stations. They are further subdivided into—

(a) "Coast stations," which are those utilised for communication with ships at sea;

(b) "Aviation stations," which are those utilised for communication with aircraft in flight.

(3) "Non-commercial stations" means fixed stations established for the purposes of research, experiment or instruction, and which are operated by the licensee solely with a view to the advancement of the art of wireless telegraphy.

"Limited commercial stations" means fixed stations established in connection with the business of the licensee, or for carrying the private or business correspondence of the licensee.

(4) "Mobile stations" means ship stations and aircraft stations.

"Ship station" means a station established on board a ship which is not permanently moored.

"Aircraft station" means a station established in any balloon, whether fixed or free, airship or flying machine.

(5) "Director-General of Posts and Telegraphs" means the Director-General of Posts and Telegraphs, India, for the time being.

(6) "Telegraph Act" means the Indian Telegraph Act, 1885 (XIII of 1885), as amended, by the Indian Telegraph (Amendment) Act, 1914 (VII of 1914).

(7) "Telegraph" has the same meaning as in the Telegraph Act.

(8) "Wireless Telegraph" means any system of communication by telegraph without the aid of any wire connecting the joints from and at which the messages or other communications are sent and received.

(9) "Rules" means the Rules made from time to time under the Telegraph Act.

(10) "International Telegraph Convention," "International Telegraph Regulations," and "Radiotelegraph Convention, 1912," mean respectively the International Convention of St. Petersburg, dated the 10th-22nd July, 1875, and the Service Regulations made thereunder the International Radiotelegraph Convention, dated the 5th July, 1912, and the Service Regulations made thereunder, and include respectively any modification of the said Conventions or Regulations made from time to time.

(11) "To radiate waves."—Apparatus shall be deemed to "radiate waves" when the transmitting apparatus is so arranged that it emits electro-magnetic waves which can be detected

by a wireless telegraph receiving apparatus situated at a distance not exceeding 400 yards.

(12) "Service signalling" means signalling by means of any system of wireless telegraphs between any fixed or mobile stations of His Majesty's Imperial, Dominion or Indian Naval, Military or Air Forces.

(13) "Certified operator" means a person who is in possession of a certificate or certificates of competency issued by the Director-General of Posts and Telegraphs, or by the proper authority in the United Kingdom, or in any British Possession or Protectorate.

(14) "Telegraph line" has the same meaning as in the Telegraph Act, and includes a telegraph line belonging to or worked by the Director-General of Posts and Telegraphs or constructed or maintained by him for any department of the Government of India or other body or person.

2. (1) Whereas
of

hereinafter called the licensee) is desirous of establishing, maintaining and working at the places (or within the area) in British India specified in the Schedule annexed hereto a wireless telegraph, under section 4 of the Telegraph Act for the sole purpose stated in the schedule annexed hereto;

(2) And whereas by reason of the provisions of the said Telegraph Act, it is unlawful to establish, maintain or work, and wireless telegraph in any place within British India except under and in accordance with a licence granted in that behalf by the Director-General of Posts and Telegraphs, and it is unlawful save as in the said Act provided to transmit or receive any message by telegraph within British India;

(3) And whereas at the request of the licensee the Director-General of Posts and Telegraphs has agreed to grant to the licensee under the power conferred by the said Act, the licences, powers and authorities hereinafter expressed and contained, for the period, upon the terms and subject to the stipulations and conditions hereinafter appearing;

(4) Now these presents witness that the Director-General of Posts and Telegraphs, in exercise of all powers and authorities enabling him in this behalf, hereby grants to the licensee during the term or period commencing on the day of the date hereof, and terminating on the 31st day of December, 192 (when the licence becomes invalid unless renewed by endorsement thereon under the hand of the Director-General of Posts and Telegraphs), licence and permission.

(a) To establish, maintain and work, apparatus for wireless telegraphs (hereinafter called the licensed apparatus) at the places (or within the area) specified in the schedule annexed hereto (hereinafter called the stations), and at such other places as may be specified in any supplemental licence given from time to time under the hand of the Director-General of Posts and Telegraphs, but subject in all respects to the rules, and provided that the licensed apparatus—

(i) Shall be of the character specified in the said schedule or in any such supplemental licence as aforesaid;

(ii) If employed for transmission, shall be of such a character that the waves emitted are as pure and as little damped as possible, and the licensed apparatus employed for reception at each station shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals. Provided, further, that the licensed apparatus employed for reception shall be

used in such a manner as to cause no interference with other stations;

(iii) Shall be so constructed as to be capable of using wavelengths specified in the said schedule as measured by the standard of measurement in use for the time being by the Government of India and such other wavelengths as shall be authorised in writing from time to time by the Director-General of Posts and Telegraphs;

(iv) If employed for the transmission and reception of messages, shall admit of such transmission and reception at the rate of not less than 20 words a minute, five letters being counted as one word;

(v) Shall be so constructed that if it is employed to radiate waves these shall only be propagated by valves or other apparatus generating pure continuous waves, and the power to be employed for this purpose shall not exceed 100 watts, measured in the case of valves in the anode circuit, and in the case of high-frequency alternators at the input terminals of the alternator;

(b) To transmit and receive messages by means of the licensed apparatus between the said stations and between the said stations and such other stations specified in the schedule annexed hereto. Provided that the transmission and reception of messages from and at the said stations shall be subject to such conditions and restrictions as the Director-General of Posts and Telegraphs may prescribe from time to time—

(c) (i) In the case of a station licensed for limited-commercial purposes, to receive money and other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or reception of messages by means of the licensed apparatus.

(ii) In the case of a station licensed for non-commercial purposes, no money or other valuable consideration shall be received by the licensee or by any other person with the authority or by the permission of the licensee for or in respect of the use of the licensed apparatus or for or in respect of the transmission or reception of messages by means of the licensed apparatus or any part thereof.

(d) To import the licensed apparatus into British India or to obtain the same from any person licensed to import wireless telegraphs in British India, and to transport the licensed apparatus from the place of importation or the premises of the said person licensed to import wireless telegraphs, as the case may be, to the station.

And it is hereby declared that the said licence and permission is granted subject to the provisions of the Telegraph Act, and on and subject to the following further conditions and provisions:—

RESTRICTION ON USE OF APPARATUS.

3. (1) The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for any purpose whatsoever except that specified in the schedule annexed hereto, or for the transmission or reception of messages except messages authorised by this licence.

(2) In the case of limited-commercial stations established at points not provided with any other means of rapid communication, such as telegraph or telephone, or in the case of interruption to such service, the Director-General of Posts and Telegraphs may prescribe that the

stations must accept such messages and communicate with such stations as may be designated. In this event the licensee shall be entitled to collect a charge for the handling of such public correspondence, the amount of such charge to be as approved by the Director-General of Posts and Telegraphs.

LICENSEE TO OBSERVE CERTAIN INTERNATIONAL CONVENTIONS, ETC.

4. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912, so far as they are consistent with the other provisions of this licence, and for the purposes of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphs in common with land and submarine telegraphs.

PROTECTION OF SERVICE SIGNALLING.

5. (1) The licensee shall not, by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus, interfere with service signalling.

(2) If the Director-General of Posts and Telegraphs is of opinion that the working of the licensed apparatus is inconsistent with the free use of service signalling, the licensee shall, when required in writing by the Director-General of Posts and Telegraphs so to do, close the said station; the making of such a requisition shall be conclusive evidence of the opinion of the Director-General of Posts and Telegraphs to the effect aforesaid.

(3) Whenever the operators of the said station perceive through the medium of the licensed apparatus that service signalling is proceeding with which the licensed apparatus is likely to interfere, they shall refrain from using the licensed apparatus until all indications that such service signalling is proceeding shall have ceased.

(4) These provisions for the protection of the service signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

AS TO INTERFERENCE.

6. (1) The licensee shall comply with all such directions and observe all such rules and regulations as may be given or made by the Director-General of Posts and Telegraphs from time to time for the purpose of preventing interference with the working of any other fixed or mobile stations, and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other station.

(2) The licensee shall so work the licensed apparatus as not to interfere with—

(a) The working of any fixed stations established in British India or the territorial waters abutting on the coast of British India, by or for the purposes of the Director-General of Posts and Telegraphs or any Department of the Government of India or any Indian State, or for commercial purposes;

(b) The transmission or reception of any messages between or at land stations and mobile stations.

STATIONS WITH WHICH LICENSED APPARATUS MAY COMMUNICATE.

7. Except as specified in clause 16, the licensed apparatus shall not be used for communicating with any stations whatsoever other than those specified in the schedule annexed hereto.

LICENSED APPARATUS NOT TO BE ALTERED OR MOVED.—PROTECTION OF OPERATORS.

8. The licensed apparatus shall not, without the consent in writing of the Director-General

of Posts and Telegraphs, be altered or modified in respect of any of the particulars, or moved from the places mentioned in the schedule annexed hereto or in any such supplemental licence as aforesaid.

(2) The licensee shall keep the licensed apparatus, and in particular the head gear receivers thereof, in a clean and sanitary condition.

(3) The licensee shall screen all lights emanating from the licensed apparatus in such manner as may be necessary to ensure the reasonable comfort and health of the certified operator.

AS TO WORKING TRANSMITTING APPARATUS.

9. (1) When employed to radiate waves the licensed apparatus shall be worked only by a certified operator, and the licensee shall provide for the working of the station such certified operators as are required by the provisions of the rules. On such occasions a certified operator shall listen on suitably adjusted receiving apparatus for three minutes, at periods not exceeding fifteen minutes, in order that he may perceive if the licensed apparatus is causing interference to authorised wireless communication. On being requested by any Government of India, Naval, Military, or Air Force station, to cease transmission the licensee shall comply immediately, and shall refrain from further transmission as long as may be required.

(2) When employed to radiate waves the call sign of the transmitting station and that of the receiving station (if any) shall be signalled or spoken at the commencement and conclusion of every transmission.

LICENSEE TO INDEMNIFY THE GOVERNMENT OF INDIA.

10. The licensee shall at all times indemnify the Government of India against all actions, claims and demands, which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

PROVISIONS AS TO SECRECY.

11. Except as specified in the schedule annexed hereto, the licensee shall not divulge to any person (other than properly authorised officials of the Government of India or under orders of a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee, and transmitted by service signalling or by any system of wireless telegraphy established and maintained by or for the purposes of the Director-General of Posts and Telegraphs or any Department of the Government of India, or by any licensee of the Government of India (other than the licensee), and shall be subject in this respect to the penalties specified in the Telegraph Act.

POWER OF DIRECTOR-GENERAL OF POSTS AND TELEGRAPHS TO INSPECT LICENSED APPARATUS.

12. The Director-General of Posts and Telegraphs, or any agent authorised in that behalf in writing by him, may at all reasonable times enter all or any of the said stations either solely or jointly with any other person or persons for the purpose of inspecting, and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such stations respectively, and the method of working and uses of such apparatus and telegraphic instruments respectively. At the request of any such authorised officer this licence or a copy of this licence certified by the Director-General of Posts and Telegraphs shall be produced by the licensee or the person for the

time being in charge of and authorised to work the licensed apparatus. The Director-General of Posts and Telegraphs shall provide one certified copy of this licence for each of the stations herein licensed.

LICENCE AND OTHER DOCUMENTS TO BE KEPT AT STATIONS.

13. The licensee shall cause to be kept at every station mentioned in the said schedule a certified copy of the licence under the hand of an officer authorised for that purpose by the Director-General of Posts and Telegraphs to be a true copy and also such documents as may be prescribed by the Director-General of Posts and Telegraphs, and as mentioned in the schedule annexed hereto.

FEE FOR LICENCE.

14. (1) The licensee shall pay to the Director-General of Posts and Telegraphs for and in respect of the licence hereby granted a fee of Rs. 10 per annum in respect of each station at which the licensed apparatus is installed.

(2) The said fee shall be payable before the issue of the licence, and the fee payable upon the renewal of the licence shall be payable before such renewal.

ROYALTY FOR LICENSED APPARATUS.

(3) The licensee shall pay to the Director-General of Posts and Telegraphs for and in respect of the licence hereby granted a royalty of Rs. _____ per annum in respect of each station at which the licensed apparatus is installed.

(4) The said royalty shall be payable before the issue of the licence, and the royalty payable upon the renewal of the licence shall be payable before such renewal.

LICENCE NOT TO BE ASSIGNED.

15. Except with the consent in writing of the Director-General of Posts and Telegraphs, the licensee shall not assign, underlet or otherwise dispose of, or admit any other person or body to participate in the benefit of the licences, powers and authorities hereby granted, or any of such licences, powers or authorities.

SIGNALS OF DISTRESS.

16. The licensee shall, so far as possible, receive all requests for assistance and all signals of distress and shall answer such requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

AS TO INTERFERENCE WITH TELEGRAPHS, TELEPHONES AND POWER CIRCUITS AND APPARATUS.

17. (1) All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not either directly or by reason of the working or uses thereof to interfere with the efficient or convenient maintenance, working or uses of any telegraph line of the Director-General of Posts and Telegraphs which may from time to time exist, or, which it is probable, that the Director-General of Posts and Telegraphs may have occasion to erect, place, fix or use, or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or uses thereof.

(2) In case any telegraph line of the Government of India shall be damaged or the efficient working or uses thereof shall be wholly or partially interrupted or otherwise interfered with, and the Director-General of Posts and Telegraphs shall certify in writing under his hand, that such damage, interruption or interference has been caused directly or indirectly by any apparatus used or intended to be used by the licensee, or by any electric circuit used or

intended to be used, or by anything done by or on behalf of the licensee in relation thereto, the licensee shall on demand pay to the Government of India all costs that shall be reasonably incurred in repairing such damage, and in removing or altering such telegraph line so as to restore the same to efficient working order, and in adding thereto or substituting therefor, either temporarily or permanently, any other telegraph line if the Director-General of Posts and Telegraphs shall certify that such addition or substitution is reasonably required by reason of such interruption or interference. Should the Director-General of Posts and Telegraphs consider that in the interests of the Government of India it is desirable that the position or circuit of the licensed apparatus be altered he may, instead of having the telegraph circuit altered or removed, order the licensee to alter or remove the licensed apparatus or circuit.

(3) The licensee shall provide against—

(a) The disturbance of the receiving apparatus of any fixed stations by electromagnetic waves of any frequency or by conduction currents emitted from the licensed apparatus.

NOTE.—For the purpose of this provision the term “disturbance” is defined as the “production of appreciable electrical effects in a syntonised receiver, other than the receiver of the licensed apparatus, adjusted as a whole to a wavelength different from that of the transmitter of the licensed apparatus.”

(b) Interference with power, telegraph, telephone lines or cables in which high potential currents might be induced by means of the licensed apparatus.

(4) In the case of licensed apparatus which is not permitted to be used with an antenna, the licensee shall ensure that the station will not radiate waves, and that the effects of conducted waves or earth currents of any frequency or nature emitted by the licensed apparatus shall not be appreciable on any telegraph or power system.

An aerial crossing above or which is liable to fall on or to be blown on to any telephone or telegraph line or overhead power wire (including electric lighting and tramway wires) must be guarded to the satisfaction of the owner or owners of the power line or lines concerned so as to prevent any damage being done in the event of a break occurring.

POWER TO TAKE POSSESSION OF OR CONTROL LICENSED APPARATUS UPON EMERGENCY.

18. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that the Governor-General in Council shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the Director-General of Posts and Telegraphs or any other officer specially authorised by him to cause the licensed apparatus and any premises, gear or plant connected therewith, or any part thereof, to be taken possession of in the name and on behalf of the Governor-General in Council, and to be used for the service of the Government and subject thereto for such ordinary services as to the said officer may seem fit, and in that event he may enter any stations in which any such apparatus is installed, and take possession of the said apparatus and use the same as aforesaid.

(2) Any such officer may, in such event as aforesaid, instead of taking possession of the licensed apparatus as aforesaid, direct and authorise such person as he may think fit to assume the control of the transmission of messages by the licensed apparatus either

wholly or partly, and in such manner as he may direct and such persons may accordingly enter any station in which any such apparatus is installed, and assume such control or the said officer may direct the licensee to submit to him or any persons authorised by him all messages tendered for transmission or received by the licensed apparatus or any class or classes of such messages, to stop or delay the transmission or reception of any messages, or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission or reception of messages as the said officer may prescribe, and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation (to be fixed by a sole arbitrator nominated by the Government of India whose decision shall be final) for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

(4) In the event of the licensee refusing to comply with the provisions of sections (1) and (2) of this clause the Director-General of Posts and Telegraphs may immediately thereupon cancel the licence without the licensee being entitled to any compensation and without prejudice to any steps the Governor-General in Council may think fit to take to obtain possession of such licensed apparatus or to claim damages.

PROVISIONS FOR DETERMINATION OF LICENCE.

19. The Director-General of Posts and Telegraphs may at any time, by notice in writing, but without assigning any reason, revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and each and every of them, as to all or any of the stations hereby licensed, and thereupon these presents and the said licences, powers and authorities, and each and every of them, shall absolutely cease, determine, and become void as to all or any of the said stations (as the case may be) without the licensee being entitled to any compensation and without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Government of India under any condition or provision herein contained.

LICENCE NOT TO AFFECT RIGHTS OF GOVERNOR-GENERAL IN COUNCIL.

20. Nothing in these presents contained shall prejudice or affect the right of the Governor-General in Council from time to time to establish, extend, maintain and work any system or systems of telegraph communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Governor-General in Council from time to time to enter into agreements for or to grant

licences relative to the working and use of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of British India or in Indian territorial waters by means of wireless telegraphs or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit and (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor-General in Council by or under the Telegraphs Act.

NOTICES, ETC.

21. Any notice, request or consent (whether required to be in writing or not) to be given by the Governor-General in Council or the Government of India under these presents may be under the hand of the Director-General of Posts and Telegraphs, and may be served by sending the same by registered post letter to the licensee at the address as given in the licence, and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Director-General of Posts and Telegraphs, India.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council.

in the presence of

The day of 192

Signed by the licensee

in the presence of

The day of 192

SCHEDULE No.

ANNEXED TO

Fixed Station Licence, Registered No.

Dated 192

1. Name of licensee.
2. Address of licensee.
3. Purpose for which station is licensed.
4. Official name of station—Exact location. If movable, place in which station is normally located and area over which it is permitted to be moved.
5. Call sign.
6. The station is licensed as a (*) station, Class (†)

(*) Here insert the "type" of station as shown in the table below.

(†) Here insert the "class" of station as shown in the table below.

Type.	Class.	Apparatus Allowed.	Communication allowed.
Limited-Commercial ..	I	Transmission and Reception	Morse, or Morse, and Speech.
Ditto ..	II	Ditto	Speech only.
Ditto ..	III	Reception only	Morse and/or Speech.
Non-Commercial ..	I	Transmission and Reception	Morse and/or Speech.
Ditto ..	III	Transmission and Reception	Nil Apparatus NOT to be used with Antenna.

Name.

Address.

Qualification.

7. Antenna—
 - (a) Description.
 - (b) Height feet.
 - (c) Horizontal length above ground feet.
 - (d) Method of support.
 8. Details of Apparatus—
 - (a) Transmitting.
 - (b) Receiving.
 9. Wavelengths (metres)—
 - Normal transmitting wave ..
 - Additional waves authorised ..
 - Range of waves over which apparatus is capable of transmitting
 - Normal receiving wave ..
 - Additional waves authorised ..
 - Range of waves over which apparatus is capable of receiving
 10. Power—
 - (a) Source
 - (b) Point where measured
 - (c) Volts. Amperes
 - (d) D/C. or A/C
 - (e) Cycles per second (A/C.)
 - (f) Maximum watts to be taken by transmitting instruments.
 11. The station is licensed to communicate with the following stations only:—
 12. The provisions of clause 11 of this licence do not apply to the following messages:—
 13. Hours during which station may work (Indian standard time)—
 - (a) Transmitting to
 - (b) Receiving to
 14. Certified operators—
 15. Authorised charges for transmission and reception of messages—
 - (a) Messages on behalf of His Majesty's Government (centimes per word).
 - (b) Other messages (centimes per word).
 16. List of documents to be kept at the station—
 - (a) Certified copy of the licence and schedule.
 - (b) General Rules and Departmental Instructions for Radiotelegraph Stations in India.
 - (c) Post and Telegraph Guide (latest Indian edition).
- Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council in the presence of
- The day of 192

MOBILE STATIONS (SHIPS AND AIRCRAFT) LICENCE.

H Registered No. _____
 Dated _____ 192 .

TELEGRAPHS.

Licence to establish, maintain and work Wireless Telegraphs in Ships and Aircraft registered in British India.

INTERPRETATION CLAUSE.

1. (1) In these presents (and in the schedule annexed hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say)—

(2) "Station" means any apparatus for wireless telegraphs erected for the purpose of transmitting or receiving messages or signals, whether with or without antenna.

"Fixed stations" means stations established on and (or on board any ship permanently moored),

"Land stations" means fixed stations established for service with mobile stations, the term being used only in respect of their service with mobile stations. They are further subdivided into—

(a) "Coast stations" which are those utilised for communication with ships at sea;

(b) "Aviation stations" which are those utilised for communication with aircraft in flight.

(3) "Non-commercial stations" means fixed stations established for the purposes of research, experiment or instruction and which are operated by the licensee solely with a view to the advancement of the art of wireless telegraphy.

"Limited-commercial stations" means fixed stations established in connection with the business of the licensee or for carrying the private or business correspondence of the licensee.

(4) "Mobile stations" means ship stations and aircraft stations.

"Ship station" means a station established on board a ship which is not permanently moored.

"Aircraft station" means a station established in any balloon, whether fixed or free, airship or flying machine.

(5) "Director-General of Posts and Telegraphs" means the Director-General of Posts and Telegraphs, India for the time being.

(6) "Telegraph Act" means the Indian Telegraph Act, 1885 (XIII of 1885) as amended by the Indian Telegraph (Amendment) Act, 1914 (VII of 1914).

(7) "Telegraph" has the same meaning as in the Telegraph Act.

(8) "Wireless telegraph" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(9) "Rules" means the rules made from time to time under the Telegraph Act.

(10) "International Telegraph Convention," "International Telegraph Regulations," and "Radiotelegraph Convention, 1912," mean respectively the International Convention of St. Petersburg, dated the 10th-22nd July, 1875, and the Service Regulations made thereunder; the International Radiotelegraph Convention, dated the 5th July, 1912, and the Service Regulations made thereunder and include respectively any modification of the said Conventions or Regulations made from time to time.

(11) "To radiate waves."—Apparatus shall be deemed to "radiate waves" when the transmitting apparatus is so arranged that it emits electro-magnetic waves which can be detected by a wireless telegraph receiving apparatus situated at a distance not exceeding 400 yards.

(12) "Service signalling" means signalling by means of any system of wireless telegraphs between any fixed or mobile stations of His Majesty's Imperial, Dominion or Indian Naval Military or Air Forces.

(13) "Certified operator" means a person who is in possession of a certificate or certificates of competency issued by the Director-General of Posts and Telegraphs or by the proper authority in the United Kingdom, or in any British Possession or Protectorate.

2. (1) Whereas

(hereinafter called the licensee) is desirous of establishing maintaining and working in the ships and aircraft registered in British India specified in the schedule annexed hereto a wireless telegraph under section 4 of

the Telegraph Act for the sole purpose stated in the schedule annexed hereto ;

(2) And whereas, it is unlawful to establish, maintain or work any wireless telegraph in any ship or aircraft registered in British India except under and in accordance with a licence granted in that behalf by the Director-General of Posts and Telegraphs ;

(3) And whereas at the request of the licensee the Director-General of Posts and Telegraphs has agreed to grant to the licensee under the power conferred by the said Act, the licenses, powers and authorities hereinafter expressed and contained for the period, upon the terms and subject to the stipulations and conditions hereinafter appearing ;

(4) Now these Presents witness that the Director-General of Posts and Telegraphs in exercise of all powers and authorities enabling him in this behalf hereby grants to the licensee during the term or period commencing on the day of the date hereof, and terminating on the 31st day of December, 192 , when (the licence becomes invalid unless renewed by endorsement thereon under the hand of the Director-General of Posts and Telegraphs), licence and permission.

(a) To establish maintain and work apparatus for wireless telegraphs (hereinafter called the licensed apparatus) in the ships and aircraft specified in the schedule annexed hereto (hereinafter called the stations) and in such other ships and aircraft as may be specified in any supplemental licence given from time to time under the hand of the Director-General of Posts and Telegraphs, but subject in all respects to the rules, and provided that the licensed apparatus—

(i) Shall be of the character specified in the said schedule or in any such supplemental licence as aforesaid ;

(ii) If employed for transmission shall be of such a character that the waves emitted are as pure and as little damped as possible, and the licensed apparatus employed for reception at each station shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals. Provided further, that the licensed apparatus employed for reception shall be used in such a manner as to cause no interference with other stations.

(iii) Shall be so constructed as to be capable of using wavelengths specified in the said schedule as measured by the standard of measurement in use for the time being by the Government of India and other such wavelengths as shall be authorised in writing from time to time by the Director-General of Posts and Telegraphs ;

(iv) Shall admit of the transmission and reception of messages at the rate of not less than 20 words a minute, five letters being counted as one word.

(v) Shall be so constructed that if it is employed to radiate waves these shall only be propagated—

In the case of ship stations by spark, interrupted continuous wave (*i.e.*, “tonic train” or “modulated by abrupt interruption”) or valves or other apparatus generating pure continuous waves ;

In the case of aircraft stations by interrupted continuous wave or valves or other apparatus generating pure continuous waves and the power to be employed shall not exceed 100 watts, measured in the case of valves in the anode circuit and in the case

of high frequency alternators at the input terminals of the alternator.

(b) To transmit and receive messages by means of the licensed apparatus between the said stations and between the said stations and land stations and other mobile stations. Provided that the transmission and reception of messages from and at the said stations when in Indian territorial limits shall be subject to such conditions and restrictions as the Director-General of Posts and Telegraphs may prescribe from time to time ;

(c) To receive money and other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or reception of messages by means of the said apparatus ;

(d) To import the licensed apparatus into British India or to obtain the same from any person licensed to import wireless telegraphs into British India, and to transport the licensed apparatus from the place of importation or the premises of the said person licensed to import wireless telegraphs, as the case may be, to the station.

And it is hereby declared that the said licence and permission is granted subject to the provisions of the Telegraph Act and on and subject to the following further conditions and provisions—

RESTRICTION ON USE OF APPARATUS.

3. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for any purpose whatsoever except that specified in the schedule annexed hereto, or for the transmission or reception of messages except messages authorised by this licence.

LICENSEE TO OBSERVE CERTAIN INTERNATIONAL CONVENTIONS, ETC.

4. (1) The licensee shall observe the provisions of the Radiotelegraph Convention, 1912, so far as they are consistent with the other provisions of this licence. In the case of licences for aircraft stations the expressions “ship” and “ship stations” in the Convention being read as if “aircraft” and “aircraft station” were substituted therefor.

(2) For the purposes of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphs in common with land and submarine telegraphs.

PROTECTION OF SERVICE SIGNALLING.

5. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with service signalling.

(2) If the Director-General of Posts and Telegraphs is of opinion that the working of the licensed apparatus is inconsistent with the free use of service signalling the licensee shall, when required in writing by the Director-General of Posts and Telegraphs so to do, close the said station ; the making of such a requisition shall be conclusive evidence of the opinion of the Director-General of Posts and Telegraphs to the effect aforesaid.

(3) Whenever the operators of the said station perceive through the medium of the licensed apparatus that service signalling is proceeding with which the licensed apparatus is likely to interfere, they shall refrain from using the licensed apparatus until all indications that such service signalling is proceeding shall have ceased.

(4) These provisions for the protection of the service signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

AS TO INTERFERENCE.

6. The licensee shall comply with all such directions and observe all such rules and regulations as may be given or made by the Director-General of Posts and Telegraphs from time to time for the purpose of preventing interference with the working of any other fixed or mobile stations and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other station.

LICENSED APPARATUS NOT TO BE ALTERED OR MOVED.

7. The licensed apparatus shall not without the consent in writing of the Director-General of Posts and Telegraphs, be altered or modified in respect of any of the particulars, or moved from the ships or aircraft mentioned in the schedule annexed hereto or in any such supplemental licence as aforesaid.

PROTECTION OF OPERATORS.

8. (1) The licensee shall keep the licensed apparatus and in particular the head gear receivers thereof in a clean and sanitary condition.

(2) The licensee shall screen all lights emanating from the licensed apparatus in such manner as may be necessary to ensure the reasonable comfort and health of the certified operator.

CERTIFIED OPERATORS TO WORK TRANSMITTING APPARATUS.

9. When employed to radiate waves the licensed apparatus shall be worked only by a certified operator, and the licensee shall provide for the working of the station such certified operators as are required by the provisions of the rules, or of any rule under the Indian Merchant Shipping Act, 1923.

LICENSEE TO INDEMNIFY THE GOVERNMENT OF INDIA.

10. The licensee shall at all times indemnify the Government of India against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

PROVISIONS AS TO SECRECY.

11. Except as specified in the schedule annexed hereto, the licensee shall not divulge to any person (other than the properly authorised officials of the Government of India or under orders of a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and transmitted by service signalling or by any system of wireless telegraphy established and maintained by or for the purposes of the Director-General of Posts and Telegraphs or any Department of the Government of India or by any licensee of the Government of India (other than the licensee) and shall be subject in this respect to the penalties specified in the Telegraph Act.

POWER OF DIRECTOR-GENERAL OF POSTS AND TELEGRAPHS TO INSPECT LICENSED APPARATUS.

12. The Director-General of Posts and Telegraphs or any agent authorised in that behalf in writing by him may at all reasonable times enter all or any of the said stations either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus

fixed or being in such stations respectively and the method of working and uses of such apparatus and telegraphic instruments respectively. At the request of any such authorised officer this licence or a copy of this licence certified by the Director-General of Posts and Telegraphs shall be produced by the licensee or the person for the time being in charge of and authorised to work the licensed apparatus. The Director-General of Posts and Telegraphs shall provide one certified copy of this licence for each of the stations herein licensed.

LICENCE AND OTHER DOCUMENTS TO BE KEPT AT STATIONS.

13. The licensee shall cause to be kept at every station mentioned in the said schedule a certified copy of the licence under the hand of an officer authorised for that purpose by the Director-General of Posts and Telegraphs to be a true copy, and also such documents as may be prescribed by the Director-General of Posts and Telegraphs and as mentioned in the schedule annexed hereto.

FEE FOR LICENCE.

14. (1) The licensee shall pay to the Director-General of Posts and Telegraphs for and in respect of the licence hereby granted a fee of Rs. 10 per annum in respect of each station at which the licensed apparatus is installed.

(2) The said fee shall be payable before the issue of the licence and the fee payable upon the renewal of the licence shall be payable before such renewal.

LICENCE NOT TO BE ASSIGNED.

15. Except with the consent in writing of the Director-General of Posts and Telegraphs the licensee shall not assign, underlet or otherwise dispose of, or admit any other person or body to participate in the benefit of the licences, powers and authorities hereby granted, or any of such licences, powers or authorities.

MESSAGES TO BE TRANSMITTED WITHOUT FAVOUR OR PREFERENCE.

16. Subject to the provisions of this licence and of the rules, the licensee shall transmit and receive messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge, order of transmission or otherwise.

SIGNALS OF DISTRESS.

17. The licensee shall so far as possible receive all requests for assistance and all signals of distress, and shall answer such requests and signals, and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

ACCOUNTS, RECORDS, ETC.

18. (1) The licensee shall keep full accounts, records and registers of all messages transmitted or received by means of the licensed apparatus, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Director-General of Posts and Telegraphs shall from time to time reasonably require to be shown, messages on the service of the Government of India being distinguished from other messages in such registers.

(2) The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for a period of at least 15 months counting from the month following that in which the radiotelegram was handed in as prescribed by the Radiotelegraph Convention, 1912, and in default of any provisions on the subject in the said Convention

between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a statute or general holiday.

(3) The licensee shall render to the Director-General of Posts and Telegraphs such accounts as the latter may from time to time direct in respect of all charges due or payable under the Radiotelegraph Convention, 1912, in respect of messages exchanged between the stations hereby licensed and land stations, and shall pay to the Director-General of Posts and Telegraphs at such times and in such manner as the latter may direct all sums which shall be due from the licensee in accordance with such accounts.

19. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that the Governor-General in Council shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the Director-General of Posts and Telegraphs or any other officer specially authorised by him to cause the licensed apparatus and any premises, gear, or plant connected therewith, or any part thereof, to be taken possession of in the name and on behalf of the Governor-General in Council, and to be used for the service of the Government and subject thereto for such ordinary services as to the said officers may seem fit, and in that event he may enter any stations in which any such apparatus is installed, and take possession of the said apparatus, and use the same as aforesaid.

(3) The licensee shall be entitled to reasonable compensation (to be fixed by a sole arbitrator nominated by the Government of India, whose decision shall be final) for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

(4) In the event of the licensee refusing to comply with the provisions of sections (1) and (2) of this clause, the Director-General of Posts and Telegraphs may immediately thereupon cancel the licence without the licensee being entitled to any compensation, and without prejudice to any steps the Governor-General in Council may think fit to take, to obtain possession of such licensed apparatus or to claim damages.

20. The Director-General of Posts and Telegraphs may at any time, by notice in writing, but without assigning any reason revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and each and every of them as to all or any of the stations hereby licensed, and thereupon these presents and the said licenses, powers and authorities, and each and every of them, shall absolutely cease, determine, and become void as to all or any of the said-stations (as the case may be), without the licensee being entitled to any compensation and without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Government of India under any condition or provision herein contained.

21. Nothing in these presents contained shall prejudice or affect the right of the Governor-General in Council from time to time to establish extend, maintain and work any system or systems of telegraph communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Governor-General in Council from time to time to enter into agreements for or to grant licences relative to the working and use of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of British India or in Indian territorial waters by means of wireless telegraphs or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit and (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor-General in Council by or under the Telegraph Act.

22. Any notice, request or consent (whether required to be in writing or not) to be given by the Governor-General in Council or the Government of India under these presents may be under the hand of the Director-General of Posts and Telegraphs, and may be served by sending the same registered post letter to the licensee at the address as given in the licence, and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Director-General of Posts and Telegraphs, India.

Signed by the Director-General of Posts and Telegraphs, India:
Telegraphs for and on behalf of the Governor-General in Council.

The _____ day of _____ 192____
Signed by the licensee _____

in the presence of
The day of 192

1. Name of licensee.
2. Address of licensee.
3. Purpose for which station is licensed—
Communication with land and mobile stations.
4. Name of ship or number of aircraft—
In which station is established.
5. Port or place of registry.

6. Particulars of apparatus—
 - (a) Transmitting.
 - (b) Receiving.
 - (c) If emergency set is installed.
7. Power—
 - (a) Source.
 - (b) Point where measured.
 - (c) Volts, amperes.
 - (d) D.C. or A.C.
 - (e) Cycles per second (A.C.).
 - (f) Maximum watts to be taken by transmitting instruments.
8. Authorised wavelengths (metres). See note. Spark, 300, 600, 1,800. C.W.
9. Number and qualification of operators.
10. Class of ship station under Radiotelegraphic Convention, 1912.
11. Nature of services performed.
12. Hours of service.
13. Authorised charges for transmission and reception of messages—
 - (a) Messages on behalf of His Majesty's Government (centimes per word).
 - (b) Other messages (centimes per word).
14. Name and address of person or persons by whom radiotelegraph accounts are settled.
15. List of documents to be kept at the station—
 - (a) Certified copy of the licence and schedule.
 - (b) General Rules and Departmental Instructions for Radiotelegraph stations in India.
 - (c) Post and Telegraph Guide (latest Indian edition).
 - (d) International List of Radiotelegraph Stations.
 - (e) Liste Alphabétique des Indicateurs d'Appel.

AUTHORISED WAVELENGTHS.

In the case of ship stations, the licensed apparatus shall be so constructed as to be capable of using wavelengths of 600 and 300 metres. The licensed apparatus may be so constructed as to use any of the other wavelengths specified or any wavelengths specified or any wavelengths prescribed by any administration for communication with direction finding stations. Provided always that the wavelength of 1,800 metres may be used for

transmission in the exceptional case contemplated by Article XXXV (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention, 1912.

In the case of aircraft stations, the licensed apparatus shall be so constructed as to be capable of using waves of 600 metres (hereinafter referred to as the "aircraft ship wave") and 900 metres (hereinafter referred to as the "aircraft normal wave"). It may also be constructed so as to be capable of using the other waves specified as "optional waves." Provided always that, if the apparatus is so constructed as to be capable of using waves of 2,000 to 3,000 metres it must always be capable of using 2,400 metres continuous wave. Provided further that the waves before referred to shall not be used without the written permission of the Director-General.

The use of the aircraft ship wave shall be confined to the system known as "interrupted continuous" wave (*i.e.*, "tonic train" or "modulated by abrupt interruptions") save in the case of great emergency when if the use of this system is impracticable this wave may be used for the transmission and receipt of spoken messages. The aircraft normal wave shall be used only for the purpose of transmitting spoken messages or for continuous waves.

The transmitting apparatus may be so constructed as to be capable of varying the wave emitted by an amount not exceeding 3 per cent. above and below the wave in use. Provided always that such variation from the normal wave shall only be employed when first calling, when communication has not been established when first calling, or in case of distress.

The receiving apparatus may be so constructed as to receive waves of any length, but it shall be constructed so as to receive the aircraft ship and aircraft normal waves. Provided always that if the transmitting apparatus is capable of using the waves mentioned above the receiving apparatus shall be so constructed as to be capable of receiving these waves.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council in the presence of

The _____ day of _____ 192

IRAQ (MESOPOTAMIA)

(See Maps 16 and 21)

IRAQ is recognised as an independent State with King Feisal at its head. A Treaty of Alliance between Great Britain and Iraq was provisionally signed in October, 1922, by which Great Britain will assist King Feisal's Government, in all matters political, civil and military, for a period of 20 years.

CONTROL AND ADMINISTRATION.

The 30-kW. wireless station at Basrah, erected during the late war has now been replaced by one of a valve type which was completed in January, 1923. In addition to its public service with ships at sea, it has established regular working with Abu-Zabal, Cairo, for traffic to and from Great Britain and Germany, and with Syria *via* Beyruth.

IRISH FREE STATE

THE laws and regulations governing wireless telegraphy and telephony are at present the same as those in Great Britain.

The control of wireless telegraphy and telephony is vested in the Minister for Posts and Telegraphs, Dublin.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
J. J. Walsh	Minister for Posts and Telegraphs	Dublin.
P. S. O'Hegarty	Secretary for the Department of Posts and Telegraphs	Dublin.
P. Mulligan	Engineer-in-Chief, G.P.O.	Dublin.

The radio stations at Valentia and Malin Head for public correspondence with ships are at present staffed and worked by the Irish Free State on behalf of the British Post Office.

Low power wireless stations have been established at Tory Island and Falcarragh, co. Donegal.

Licences are issued to approved institutions and individuals for experimental transmission, the fee payable being £1 per annum.

There is as yet no broadcasting station in the Irish Free State, but the Government has under consideration a proposal to establish a State-owned broadcasting station in Dublin.

Licences for the reception of broadcast matter are issued at a fee of £1 per annum. Special licences are also issued to amusement purveyors at the same fee, and to hotels, restaurants, etc., at a charge of £5 per annum.

ITALY

(See Maps 2 and 13.)

THE executive power of the State belongs exclusively to the Sovereign, working through responsible Ministers; whilst the legislative authority rests conjointly with the King and Parliament, the latter consisting of two Chambers.

CONTROL.

Wireless telegraph land stations in the Kingdom belong to the Government and are operated by the Ministry of the Navy (Department of Artillery and Armaments), the Ministry of Posts and Telegraphs and the Ministry of War. Each Ministry includes a special department for dealing with wireless telegraphy. No wireless societies or clubs have yet been established on a serious basis, but many are about to be formed.

ADMINISTRATION.

The current Rules and Regulations which we print below (and which cover the Italian Colonies) may be summarised in the following List. There are at present none relating to aviation nor for amateur or experimental transmitting stations except as provided under Articles 6, 7 and 8 of the Royal Decree No. 1067.

The Law No. 395 of 30th June, 1910, and Regulation No. 227 of 1st February, 1912 (copies of which appeared in the YEAR BOOK for 1923) are now obsolete, and replaced by Royal Decrees No. 1067 of 8th February, 1923, and No. 1262 of 5th June, 1923; and the Decree No. 1587, of 12th November, 1916 (which was also printed in the YEAR BOOK for 1923) is superseded by the Royal Decree No. 1786, of 5th December, 1920.

A—Royal Decree No. 2223, of 4th November, 1919, regarding Certificate in Radiotelegraphy.

B—Royal Decree No. 1786, of 5th December, 1919, regarding Ship Stations.

C—Decree of 23rd May, 1921, regarding Control of Radiotelegraphic Correspondence on board Ships.

D—Royal Decree No. 1067 of 8th February, 1923: Regulations for Wireless Telegraph Service.

E—Royal Decree No. 1262, of 5th June, 1923: Supplementary to No. 1067.

ROYAL DECREE No. 2223, OF 4TH NOVEMBER, 1919.

VITTORIO EMANUELE III.

A By the grace of God and the will of the Nation, King of Italy.

Having seen the law of 30th June, 1910, No. 395, and the relative regulations approved by Royal Decree 1st February, 1912, No. 227;

Having seen the Royal Decree No. 1062 of 11th July, 1913, ratifying the International Radiotelegraphic Convention of London, 1912, and the acts thereto annexed;

Having seen the Royal Decree of 28th December, 1913, No. 1480, which extends to the radiotelegraph service in the Italian Kingdom the provisions of the above-mentioned Convention of London;

Having recognised the necessity of establishing—in harmony with the provisions of Article X of the Service Regulations annexed to the aforementioned Convention of London—opportune regulations for the issue of Government certificates to radiotelegraphists desirous of performing radiotelegraph service on board mercantile vessels;

On the proposal of the Minister Secretary of State for the Navy, in agreement with the Minister of Posts and Telegraphs;

WE HAVE DECREED AND WE DECREE:

ART. 1.—Certificates of competency to perform radiotelegraphic service on board commercial vessels, as contemplated in Article X of the Service Regulations annexed to the International Radiotelegraph Convention of London, will be issued by the School of Semaphorists and Radiotelegraphists of the Royal Navy at Spezia (Comando difesa militare marittima.)

2. At the aforementioned school shall be instituted and maintained up to date a general register of all the candidates examined, with particulars of the examination undergone by each candidate, and the result. The school shall also preserve in its archives a copy of the photograph of each candidate, furnished with all the particulars entered in the general register and also a personal description of the candidate.

The Ministry of Marine shall be empowered to authorise, when circumstances require and merely as an exceptional case, that candidates shall be examined at other branches of the Royal Navy, but the examination must always be conducted under the supervision of the officials of the Royal School of Semaphorists and Radiotelegraphists.

ART. 2.—Candidates shall be examined by a suitable commission composed of:

The Director of the aforementioned School or a superior officer of the Staff of the Royal Navy.

Two officers or officials of the Royal Navy who are specialists in radiotelegraphy.

The commission will assemble in the early days of each month.

ART. 3.—Candidates, in order to be admitted to the examinations, shall forward, in due time, an application on stamped paper to the value of two lire addressed to the "Direzione della regia scuola semaforisti e radiotelegrafisti Spezia," and such application must be accompanied by the following documents:

Certificate of study (not less than the "licenza elementare").

Authentic copy of birth certificate proving that the applicant has completed his eighteenth year but is not more than thirty years of age;

"Certificato di penalità" (police certificate of good conduct), the date of which must not be more than two months prior to the date of presentation of such document;

Certificate of good conduct and personal character issued by the Mayor of the Commune in which the applicant is resident, bearing the visé of the Prefect or Sub-Prefect;

Any certificates testifying to the applicant's knowledge of radiotelegraphy and foreign languages;

Certificate of Italian citizenship;

Certificate of entry in the lists of the military or naval levies and the certificates of service performed;

Two photographs;

Postal order for L.2.05, the fee for the certificate of radiotelegraphy. (This amount will be refunded to candidates failing to pass the examination.)

The candidate shall declare in the application whether he has undergone previous examination, and if so the date and place of such examination.

N.B.—A man presenting the certificate of "esito di leva" or the extract of the "matricola della gente di mare" will not be required to present a certificate of Italian citizenship.

All documents shall be presented on paper stamped to the prescribed amount, unless the applicant is able to show, by authentic document, that he is in a state of poverty. The application, however, must always be written on stamped paper.

ART. 4.—Applicants who are admitted to the examinations after having presented the prescribed application duly documented will be notified by the School authorities as to the day on which they are to present themselves to undergo the test.

ART. 5.—The Examining Commission shall rigorously satisfy itself that the candidate fulfils the conditions prescribed in the aforementioned Article X of the Regulations—namely, that he possesses a perfect knowledge of the radiotelegraph apparatus as shall enable him to render efficient radiotelegraph service on board ship.

Candidates must possess the knowledge of radiotelegraphy stipulated in Appendix A (programme of examination for the granting of Government radiotelegraph certificates), signed, on Our order, by the Minister of Marine.

ART. 6.—In addition to the above-mentioned tests candidates must undergo practical tests in transmission and oral reception, the duration of such tests to be not less than ten minutes.

In connection with the provisions of Article X of the Regulations of Service annexed to the International Radiotelegraph Convention of London, shall be issued:

A first-class certificate in radiotelegraphy to those who attain a speed of transmission and oral reception not less than twenty words per minute in a foreign language;

A second-class certificate in radiotelegraphy to those who attain a speed of transmission and oral reception not less than twelve and not exceeding nineteen words per minute in a foreign language. An average of five characters per word shall be taken as a basis for calculation.

ART. 7.—The aforementioned certificate shall be designated "Brevetto internazionale di radiotelegrafista" and shall bear the photograph of the holder, duly legalised by the stamp of the authority of the Royal Navy, and the personal description of the holder and the qualifications attained.

ART. 8.—Applicants who have been declared by the Examining Commission to be unqualified to receive the International Radiotelegraph Certificate cannot present themselves for further examination if at least six months have not elapsed from the date of the first examination.

ART. 9.—Radiotelegraphists who have obtained a second-class certificate in radiotelegraphy shall only undergo the examination to obtain a first-class certificate after three months have elapsed from the date of the last examination.

ART. 10.—Candidates who have been found unqualified after two consecutive examinations cannot undergo a further test without the special and exceptional authorisation of the Ministry of Marine (Direzione generale di artiglieria e armamenti).

ART. 11.—The issue of duplicate international certificates in radiotelegraphy is forbidden without the special authorisation of the Ministry of Marine (Direzione generale di artiglieria e armamenti).

ART. 12.—Radiotelegraphists must undertake to maintain the secrecy of correspondence.

ART. 13.—All violations of the secrecy of correspondence, of the International Radiotelegraph Convention and the relative regulations, and of the general rules governing the working of radiotelegraph stations open to public service will be punished by the temporary or permanent withdrawal of the radiotelegraphist's certificate, according to the seriousness of the infraction committed by the radiotelegraphist, irrespective of any more severe punishment that may be imposed.

ART. 14.—The present decree will enter into force from the day of its publication in the *Gazzetta ufficiale*.

We order that the present decree, to which has been affixed the seal of State, be inserted in the official collection of laws and decrees of the Kingdom of Italy, and we enjoin its observance upon all those whom it may concern.

Given this day, November 4, 1919, at San Rossore.

VITTORIO EMANUELE,
Sechi-Chimienti.

Seen, The Keeper of the Seals :
Mortara.

APPENDIX A.

PROGRAMME OF EXAMINATIONS FOR THE GRANTING OF GOVERNMENT CERTIFICATES IN RADIOTELEGRAPHY.

Diagram of the various radiotelegraph apparatus used and the working of the individual parts.

A perfect knowledge of such apparatus, its adjustment and method of removing faults.

Tuning of a station. Rules relative thereto. Cimoscopi (?)

Receiving apparatus and the mode of using them.

Sources of energy which feed radiotelegraph apparatus: Dynamos, alternators, transformers, converter groups and converters. Accumulators and their maintenance.

Measures necessary in the practice (working) of radiotelegraphy. Voltmeters, ammeter, methods of insulation.

Antennæ and earth.

Precautions to avoid damage to the material and staff during transmission.

Protection devices of the oscillatory circuits.

Perfect knowledge of the general working rules of radiotelegraph stations open to public service, and also of the International Radiotelegraph Convention and the Service Regulations annexed thereto.

Perfect knowledge of the conventional abbreviations.

Knowledge of foreign languages (optional).

Duties of the radiotelegraphist as regards the radiotelegraph service.

Secrecy of correspondence.

Rome, 4th November, 1919.

Seen, by order of His Majesty the King,
SECHI,
Minister of Marine.

ROYAL DECREE No. 1786, DATED 5TH
DECEMBER, 1920,

B Requiring all commercial vessels, whether propelled mechanically or by sails, and used for the transport of passengers, and cargo vessels of a gross tonnage of 1,600 or more tons, when proceeding to sea, to be equipped with a radiotelegraph installation.
(Published in the *Gazzetta Ufficiale* of the 27th Dec mber, 1920, No. 304).

VICTOR EMMANUEL III

By the grace of God and the will of the Nation, King of Italy.

Having seen the Law of June 30th, 1910, No. 395, relative to radiotelegraphy and radiotelephony and the regulations appertaining thereto, approved by Royal Decree of February 1st, 1912, No. 227;

Having seen the Royal Decree of July 11th, 1913, No. 1006, which gives effect to the International Radiotelegraph Convention of London; Having seen the "Decreti Luogotenenziali" (Provisional Decrees) of the 12th November, 1916, No. 1587, and of 21st January, 1917, No. 180;

Having heard the Council of Ministers;
On the proposal of the Minister for Industry and Commerce, in agreement with the Minister of Marine and with the Minister of Posts and Telegraphs;

WE HAVE DECREED AND WE HEREBY
DECREE:

ART. 1.—All commercial vessels whether propelled mechanically or by sails, used for the transport of passengers and cargo vessels of a gross tonnage of 1,600 or more tons must, whilst at sea, carry a radiotelegraph equipment.

ART. 2.—From this obligation to carry a radiotelegraph equipment are exempted vessels used for the transport of passengers and of a gross tonnage of less than five hundred tons, which make voyages of less than ten hours' duration and do not depart more than fifty miles from the nearest coast.

The Ministry of Industry and Commerce shall have power, in exceptional cases, to dispense from the obligation to carry wireless plant those vessels for which wireless telegraphy would not be required, having regard to the coastal route followed by the vessel, local conditions of the voyage and other circumstances.

ART. 3.—Vessels required to carry radiotelegraphic plant are, for the purposes of the radiotelegraph service, divided into three classes according to the classification prescribed for ship stations by Article XIII of the Service Regulations annexed to the International Radiotelegraph Convention signed in London on the 5th July, 1912, namely:

1st Class.—Vessels with ship stations maintaining a continuous service.

In the first class are included all vessels performing long voyages and recognised as suitable for the transport of two hundred or more persons.

2nd Class.—Vessels with ship stations maintaining a service of limited duration.

In the second class are included all vessels performing any service whatever, not classified in the previous class or in the third class mentioned hereunder.

3rd Class.—Vessels with ship stations having no fixed working hours.

In the third class are classified all vessels carrying less than 50 persons, irrespective of the service they maintain.

In determining the number of persons that a vessel can carry, for the purposes of the present decree, account must be taken of the total number of persons composing the normal crew and the maximum number of passengers which the vessel is authorised to carry, according to the certificates issued by the Maritime Authorities.

The owner or agent of a vessel classified in the second or third class, is entitled to require the vessel to be entered in a higher class, should it comply with all the obligations established for a higher class.

ART. 4.—Vessels which are not bound to maintain a permanent listening service but which, by the terms of the present decree, are required to carry a radiotelegraph equipment, must maintain, whilst at sea, a permanent listening service, if the Minister should deem this to be advisable for the safety of human life at sea.

In the event of there being invented and internationally approved an automatic receiving apparatus for the distress call, it shall be permissible on vessels entered in the second class and having two radiotelegraphists, to substitute for one of them a member of the crew, duly authorised for the purpose, even though performing other duties on board.

ART. 5.—The radiotelegraphic plant, imposed by the present decree, must be able to transmit by day, from ship to ship, signals clearly perceptible, in normal circumstances and conditions, at a minimum distance of one hundred nautical miles.

Each vessel which is obliged to carry a radiotelegraph installation must, irrespective of the category in which it is classified, be equipped, in conformity with Article XI of the Regulations annexed to the International Radiotelegraph Convention of 1912, with a radiotelegraph emergency set the parts of which must be protected, as far as possible, from likelihood of damage.

In any case the emergency plant must be situated entirely in the upper parts of the vessel and as high as practically possible.

The emergency plant must have, as indicated in Article XI of the regulations aforementioned, a source of energy entirely its own. The plant must be capable of being brought rapidly into operation and of working for at least six hours with a minimum range of eighty nautical miles for vessels registered in the first class and fifty nautical miles for those entered in the other two classes.

If a normal installation, the range of which, according to the terms of the present article, is at least one hundred miles, meets all the requirements indicated below, the emergency plant is not obligatory.

ART. 6.—Before being put into operation, each installation must be inspected and approved by a Commission composed of an officer of the "Capitaneria di Porto" (Port Authorities),

a delegate of the Ministry of Marine who is a specialist in radiotelegraphy, and an inspector or expert on the Italian Naval Register.

The certificate of inspection and approval which constitutes a working licence, in accordance with the terms of Article 9 of the Regulations annexed to the Radiotelegraph Convention of 1912, shall show the characteristics of the plant in relation to the decree of concession.

It shall be prepared in duplicate, a copy of which shall be handed to the Commanding Officer of the vessel and shall not be issued if the plant does not comply with the conditions established by the Radiotelegraph Convention of 1912 and the previous decree.

Radiotelegraph stations shall be inspected at least once a year by a Commission composed as stated above.

The cost of inspection and approval of apparatus is to be borne by the licensee.

ART. 7.—Every captain of a vessel receiving a distress call sent out from a vessel in distress is bound to proceed to the assistance of those in danger.

The captain of any vessel in distress has the right to determine which vessel or vessels, amongst those which have replied to his appeal, he considers most suitable to render him assistance. He shall not avail himself of this right until after consultation, as far as possible, with the captains of the said vessels. The latter are bound to comply at once with the request, and to proceed at full speed to the assistance of those in distress.

The captains of the vessels upon whom it is incumbent to render assistance, are freed from this obligation directly the captain or captains called upon have intimated that they are complying with the summons, or the captain of one of the vessels which has reached the scene of the accident shall have made known to them that their assistance is no longer necessary.

If the captain of a vessel finds it impossible in the special circumstances of the case, to proceed to the assistance of the vessel in distress, he shall immediately inform the captain of the latter.

He must also enter in his log the reasons justifying his action.

It is incumbent on the licensees of ship stations to report to the General Direction of the Mercantile Marine all violations of the provisions of the present Article.

ART. 8.—For the purpose of Article 1 of the present decree, the owners or agents of vessels shall, within one month from the publication of the present decree, make application to the Minister of Posts and Telegraphs for the requisite licence for radiotelegraph stations to be installed on board existing vessels, not yet equipped with radiotelegraph apparatus and not relieved from the obligation to carry an installation in accordance with the terms of Article 2.

As regards vessels which may become nationalised after the date of the present decree and be thereby under the obligation to carry radiotelegraph apparatus on board, the certificate of nationality or the provisional authorisation will not be issued unless the aforementioned agents or owners prove that they have presented the requisite application for a licence for the respective radiotelegraph ship station.

Owners or agents of vessels can, upon making application to the Ministry of Posts and Telegraphs, arrange for the wireless stations on board their vessels to be operated by private radiotelegraphic firms or companies.

In this case the licence for ship stations may be given to the said firms or companies.

The owners or agents, however, even in this case, are subject to all the obligations and responsibilities which are incumbent on them by reason of the provisions contained in the present decree.

In applications for licences and in applications made in order to secure that radiotelegraph ship stations shall be operated by private radiotelegraph firms or companies, all the characteristics of the vessel shall be indicated with sufficient clearness to enable the classification of the vessel to be determined, in accordance with the previous Article 3.

The aforementioned applications shall be presented to the respective Port Authorities, who, after having ascertained that the characteristics of the vessels indicated in the applications are correct, shall forward the said applications to the General Directorate of the Mercantile Marine.

The latter shall designate the category as above, shall fix the date on which each ship station shall be ready to operate, and, with such indications, transmit the application to the Ministry of Posts and Telegraphs, which will issue the corresponding licence.

For proved cases of *force majeure*, extensions may be granted to the date aforementioned by the Direction General of the Mercantile Marine.

ART. 9.—No clearance will be granted to vessels in respect of which an application for a licence for the installation had not been made within the period specified by Article 8 or to vessels which, having the requisite licence, have not the station in order according to the foregoing provisions and in operation within the period fixed by the terms of the licence, save however, for the provisions of the last paragraph of the preceding Article 8.

As regards vessels which have not complied with the obligation as regards a wireless installation but which have to proceed to sea in order to perform public services or services of national importance, the Ministry for Industry and Commerce shall have power to order the installation and the working of the radiotelegraph station to be effected officially, at the expense of the owner of the vessel.

Payment of such expenses and of those for working the station shall be recoverable in the method indicated in Article 205 of the Code of the Mercantile Marine.

ART. 10.—No alteration is made in the terms of the Royal Decree of the 4th November, 1919, No. 2223, regarding the Issue of International Certificates to Radiotelegraphists.

ART. 11.—The present decree, which supersedes the Provisional Decrees of the 12th November, 1916, No. 1587, and of 21st January, 1917, No. 180, shall come into force from the day of its publication in the *Gazzetta Ufficiale* of the Kingdom and will be presented to Parliament for its conversion into Law.

We order that the present decree, to which the seal of State has been affixed, be inserted in the Official Collection of Laws and Decrees of the Kingdom of Italy, and we enjoin all whom it may concern to observe it and to cause it to be observed.

Given at Rome, 5th December, 1920.

VICTOR EMMANUEL.

Giolitti-Alessio-Sechi-Pasqualino-Vassallo.

Place of seal: Seen by the Keeper of Seals: Fera.

Registered at the Court of Account with reserve on 20th December, 1920.

Reg. 182. Government Deeds a.f. 116. Gisci.

DECREE 23RD MAY, 1921.

THE MINISTERIAL SECRETARIES OF STATE FOR THE MARINE AND POSTS AND TELEGRAPHS.

C In view of the statute of the 30th June, 1910, No. 305 on Radiotelegraphy and Radiotelephony and the Regulation relating, approved by Royal Decree of the 1st February, 1912, No. 227;

In view of Royal Decree of 11th July, 1913, No. 1006 which ratifies the 1912 International Radiotelegraph Convention of London and the acts added to it;

In view of Royal Decree No. 1480 of the 28th December, 1913, extending the provisions of the said Convention to the Radiotelegraphic Service of the kingdom;

In view of the Ministerial Decree No. 1537 of the 12th November, 1916, and the Royal Decree Law No. 1786 of 5th December, 1920, which makes it obligatory for any category of merchant ships to have radiotelegraphic installations on board;

The necessity being recognised that control on private radiotelegraphic correspondence accepted on board ships should be exercised with the due guarantee;

IT IS DECREED:

ARTICLE 1.—In accordance with the provisions of Article X, Clause 4 of the Regulation annexed to the 1912 International Radiotelegraphic Convention of London, the radiotelegraphic service of every ship station is placed under the supreme control of the commander of the boat who shall exercise the requisite control over all correspondence.

ARTICLE 2.—No radiotelegraphic correspondence can be transmitted or delivered by the ship station unless passed by the commander of the ship.

ROME, May 23rd, 1921.

The Ministers,

Signed.....
Signed.....

ROYAL DECREE No. 1067, DATED 8TH FEBRUARY, 1923.

D Regulations for the Wireless Telegraphic Service (*Gazzetta Ufficiale* No. 125 of May 29th, 1923.)

In virtue of the powers conferred on the Government by Law No. 1601 of 3rd December, 1922;

In view of Law No. 395 of 30th June, 1910, on radiotelegraphy and radiotelephony and the relative regulations for the execution thereof, No. 227 of 1st February, 1912;

In recognition of the necessity to modify the regulations contained in the aforesaid Law No. 395 of 30th June, 1910, by rules corresponding more nearly to the present requirements of the wireless telegraph service;

IT IS DECREED

ART. 1.—The plant for communication by means of electro-magnetic waves, without the employment of connecting conduction-wires, or by means of guided waves, as well as the use of such plant, whether on land, on board ship, or on board of air ships, in Italy, or her colonies, is reserved to the State.

ART. 2.—The Government is empowered to grant concessions or licences for the plant and the working of the services indicated in Art. 1, to any person, body or administration, public or private, of whatever nature.

ART. 3.—The direction and control of the wireless service, and of communication by means of guided waves, shall be in the hands of the Ministry of Posts and Telegraphs (with the exception of those for military purposes.

ART. 4.—In order to avoid interference by public or private wireless communications with the working of such communications as may be permanently established in the military interests, The Ministry of Posts and Telegraphs will, in consultation with the Ministries of War and of Marine, prescribe in the regulations the characteristics regarding the working of public or private wireless communications.

ART. 5.—The Minister of Posts and Telegraphs, in collaboration with the consultative tecnico-legal Commission established by Royal decree No. 71 of 7th January, 1923, will decide:

(a) Controversies which may arise—

1. Between the State and the concessionaires;
2. Between the State departments working wireless communication stations;
3. Between the concessionaires.

(b) As to the redemption of the concessions;

(c) As to the eventual compensation due in the case of redemption, revocation, or suspension of the concessions.

ART. 6.—Concessions for the installation and working of transmitting and receiving wireless stations, whether for public or private use, will be granted by Royal Decree, on the initiative of the Minister of Posts and Telegraphs, in consultation with the consultative tecnico-legal Commission.

On the other hand, authority to set up and work simple receiving stations, for the private use of the concessionaire, will be conferred merely by means of a licence issued by the Ministry of Posts and Telegraphs, even if the stations are designed for the reception of news, music, etc., transmitted from a station which has been granted a concession for this purpose.

The Government is empowered to grant concessions over its own wireless installations to private industry. In such case the concessionaire may be obliged, at the request of the Government, to take over the staff assigned to such installations.

ART. 7.—The concessionaires of transmitting and receiving wireless stations, which are for their own use, to the exclusion of any communication whatever for third parties, will pay, in advance, an annual due, which shall be fixed, by the decree granting the concession, between Lit. 300 and Lit. 12,000, in terms of the regulations which shall be issued by ministerial decree.

In guarantee of the payment of this due, the above-mentioned concessionaires shall be required, at the time of the granting of the concession, to deposit caution money equal to one year's due.

The Ministry of Posts and Telegraphs is empowered to reduce such due to one-half, when the concessions in question relate to stations for important scientific, or instructional purposes, or of public interest.

ART. 8.—Concessionaires of wireless stations which are merely receiving, for private use, will pay to the State, in advance, an annual due which will be prescribed in the licence of concession mentioned in Art. 6, and which will be of an amount between Lit. 180 and Lit. 600 for each station, when such station is authorised to receive messages of various lengths of wave in terms of the above-mentioned regulations.

If, however, the receiving station is guaranteed to receive messages of only one fixed length of wave, the due will be fixed between Lit. 60 and Lit. 240, in terms of the above-mentioned regulations.

If the concessionaires of the said receiving stations are authorised to admit the public, or persons who have taken out a subscription with them, to participate personally in the receiving of news, or if they employ any method of disseminating the news received, the above-mentioned dues will be quadrupled.

In guarantee of the payment of the due, the concessionaire will deposit, at the time of the granting of the concession, caution money equal to the due for one year.

ART. 9.—The concessionaires of stations for the public service will pay yearly to the State, in three-monthly deferred instalments, a due equal to a percentage of their gross receipts, according to the balance sheet, and which must in no case be less than 2 per cent. They will, moreover, pay to the State progressive percentages on the nett profit on the share capital, in relation to the entity of the dividends payable to the shareholders, when such dividends exceed 7 per cent. of the capital.

The percentage on the gross receipts and the progressive percentages on the nett profits shall be prescribed in the decree granting the concession.

In guarantee of payment, the concessionaires will make a deposit, the amount of which shall be established in the decree granting the concession, and which shall not be less than Lit. 2,000 for each station.

The caution money will be subject to revision every three years.

In all cases in which the concessionaires have no receipts from the public, the financial arrangements between the State and the concessionaires will be regulated in each individual case by special rules to be laid down in the decree granting the concession.

ART. 10.—The concessions may be suspended or revoked, without any compensation:—

(a) When the installations, by not conforming to the technical conditions laid down in the decree granting the concession, cause a disturbance to other wireless stations, either belonging to the State, or for public use;

(b) For serious and repeated infractions by the concessionaire of the obligations laid down in the decree granting the concession;

(c) In all other cases provided for by the regulations relative to this decree.

ART. 11.—The Government is empowered at any time to resume possession of wireless stations, on giving a year's warning.

It is, however, in the power of the Ministry, to renounce the exercise of this right for a fixed number of years, up to 15.

The redemption shall include the cession of all materials and apparatus, and, in certain cases, of the building where the station is situated and the vesting in the State of all the rights of the concessionaires, including those involving third parties.

The price of the redemption shall be decided, after the consultative tecnico-legal Commission has given an opinion, in agreement with the concessionaires, and must not exceed the value of the material in operation at the time of the estimate, taking into account depreciation for the period since the initiation of the undertaking and of any enlargements and renewals.

In the event of disagreement, the decision shall rest, without appeal, with three arbiters, chosen respectively by the Government, the concessionaire and the President of the Court of Appeal at Rome.

If a controversy should arise involving more than one concessionaire, and if the concessionaires are unable to agree as to the nomination

of their arbiter, each of them shall propose a name, and one of the names so chosen shall be drawn by lot, in the presence of a judicial delegate of the President of the Tribunal of Rome.

The Government may take possession of the radiotelegraphic stations without waiting until the redemption price shall have been fixed.

ART. 12.—The length of the concession will be laid down in the relative decree, but must not exceed 25 years.

ART. 13.—The Government is empowered to suspend, limit, or take over, for serious reasons of a military character, or affecting public security, the working of stations which have been conceded.

When, in the exercise of such power, the State is obliged to pay indemnities, these must not exceed, in each case, an amount corresponding to the working expenses which may remain as a charge on the concessionaire, as well as interest and amortisation of capital.

ART. 14.—The concession is personal; the concessionaire is therefore forbidden to let or cede the concession, either in whole or in part, without the express authority of the Ministry of Posts and Telegraphs.

ART. 15.—An obligation is laid upon the concessionaire to maintain and guarantee secrecy as regards the telegraphic and telephonic service and to answer for the work done by his dependents.

ART. 16.—The Ministry of Posts and Telegraphs (after taking the opinion of the consultative tecnico-legal Commission) is empowered to fix and modify the tariffs for the public wireless service.

When the service has been conceded, as laid down in Article 2, the tariffs must be submitted to the approval of the above-mentioned Ministry by the Concessionaires, and the Ministry may, even during the course of the concession, require that they should be reduced, when the nett profits of the undertaking exceed ten per cent.

ART. 17.—The personnel of all wireless stations, of whatever nature, or stations for guided waves, administered by any public or private body, must hold the certificate granted by the Ministry of Posts and Telegraphs, after examination on lines laid down, in consultation with the consultative tecnico-legal Commission.

The Ministry of Posts and Telegraphs is empowered to oblige the concessionaire to dismiss personnel employed by him in the service of the installations whom he considers no longer fit for such duties, in the interests of public safety; and also, for the same reasons, to forbid the engaging of employees.

ART. 18.—Every infraction of Article 1 of this decree is punishable with a fine not exceeding Lit. 2,000 and with imprisonment for a period not exceeding one year, these penalties being applicable cumulatively or separately, according to circumstances.

The magistrate is also empowered to order the confiscation of the apparatus.

While awaiting penal proceedings, the Ministry of Posts and Telegraphs, may, if requested by the Prefect, in the public interest, take possession of the installations and provide, if it seems good to him, for their removal or for their management direct, on the strength of a peremptory decree.

ART. 19.—Anyone causing destruction or damage to the installation, or interrupting or compromising, even temporarily, the wireless service, or abusing the signals for help reserved for ships or airships in danger, will be punished under Article 315 of the penal code. In the

case of soldiers, the punishments will be those laid down in the Military Penal Code.

It is understood that the punishments laid down in this decree are without prejudice to those of greater magnitude which may be awarded in terms of the military and civil penal code.

ART. 20.—Contrary to Article 12 of Law No. 2356 of 25th June, 1865, our Minister of Posts and Telegraphs is empowered to issue a declaration of public utility, in so far as referring to the installations mentioned in Article 1 of this decree.

Such power may be exercised by this Minister, if he thinks it necessary, on the request of the concessionaires mentioned in Article 2 of this decree.

ART. 21.—Law No. 395 of 30th June, 1910, Regulation No. 227 of 1st February, 1912, and every other disposition which is contrary to this decree, is repealed.

ART. 22.—The power to issue Regulations, by ministerial decree, after consultation with the consultative tecnico-legal Commission, for the execution of this decree, is delegated to the Government.

TEMPORARY PROVISIONS.

ART. 23.—While waiting for the publication of the regulations for the execution of this decree, the following temporary measures are enacted:

The request for a concession in respect of wireless installations must contain:

(a) A precise indication of the person or body making the request; if the concession is requested by a person, the penal certificate issued by the office of judicial registers, and the certificate of good conduct issued by the Syndic of the commune in which the applicant is legally domiciled, or habitually resides, must be attached to the request.

If the concession is requested by a body, or by a commercial company, an authentic copy of the Articles of Association of the body or company, and of its statute, and proof of the execution of the formalities legally necessary in order to perfect the constitution of the body or company, must be attached to the request.

Requests for concessions must all, without exception, bear the visa of the Prefect of the province where the person making the demand resides;

(b) an indication of the nature and scope of the concession, of the locality of the installation and of its supposed range;

(c) an indication of the length of time for which the concession is asked, and between what dates the station is likely to be in working order.

The dues mentioned in Articles 7, 8 and 9, will be fixed by the Ministry of Posts and Telegraphs, after consultation with the consultative tecnico-legal Commission.

The maximum plans of the installation must be attached to the requests for a concession.

ROYAL DECREE, No. 1262, DATED 5TH JUNE, 1923.

E SUPPLEMENTING THE PROVISIONS OF ROYAL DECREE, No. 1067 OF 8TH FEBRUARY, 1923, CONCERNING THE WIRELESS TELEGRAPHIC SERVICE (*Gazzetta Ufficiale*, No. 144 of 20th June).

In virtue of the powers conferred on the Government by Law No. 1601, of 3rd December, 1922; In view of Royal Decree No. 1067, of 8th February, 1923,

IT IS DECREED

ART. 1.—The following Articles are appended to the transitory dispositions of Royal Decree No. 1067, of 8th February, 1923:

ART. 24.—The Minister of Posts and Telegraphs has the power, up to three months from the publication of the Regulations mentioned in Art. 22, to revoke entirely the concessions granted before the publication of the present decree, for which the relative plant is not installed and placed in operation, and those for which part of the conceded plant is in operation, in so far as concerns the plant not installed, without the right of the concessionaire in any case to indemnity or compensation under any title.

ART. 25.—Until the Ministry of Marine shall provide with proper personnel for the functioning of wireless stations, which in addition to military service, simultaneously perform that of the correspondence of the Government and the public, the management and technical control of such stations shall continue to be entrusted to the Ministry of Marine, which in this regard shall act in agreement with the Ministry of Posts and Telegraphs.

For this purpose and for the time indicated in the preceding paragraph in virtue of Royal Decree No. 764, of 18th March, 1923, two officials of the Ministry of Marine and one of the Ministry of War shall be delegated by the respective Ministries to take part, in a deliberative capacity, in the work of the technical legal consultative commission, instituted by Royal Decree No. 71, of 7th January, 1923, in so far as questions of wireless telegraphy are concerned.

ART. 2.—The exceptions to the dispositions of paragraphs 1 and 2 of Article 17 of Royal Decree No. 1067, of the 8th February, 1923, defined by paragraph 3 of the said Article, are extended to the stations on board ship for which the Ministry of Marine will provide.

ART. 3.—The permanent consultative commission for wireless services, constituted by the Law No. 395 of the 30th June, 1910, is suppressed.

ART. 4.—The present decree will be effective from the date of its publication in the *Gazzetta Ufficiale*.

JAPAN

(See Maps 17 and 19).

Including : Hokoto (Pescadores), Sakhaluin (Karafuto), Kwantung, Formosa, Korea, Kiau-Chaw.

THE present Emperor is Yoshihito (Harunomia), who retains the rights of sovereign, and is assisted by a Cabinet and Privy Council.

CONTROL.

The Department of Communications controls all Government stations and inspects all private stations in Japan. These are divided as follows:—

Government Land Stations	..	..	..	..	20
Private Land Stations	..	..	..	..	2
Government Ship Stations	..	..	..	..	31
Private Ship Stations	..	..	..	..	541

Besides these stations there are five Government stations, under the jurisdiction of the Government-General of Korea and Kuantung, all open for public communication. In addition, there are many Navy and Army stations under the control of the Navy and Army Departments.

Wireless work in the Department of Communications is divided into two sections: (a) The Research Laboratory, and (b) the Installation and Inspecting Section.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. T. Inukai ..	Minister of Communications	Tokyo.
Mr T. Kuwayama ..	Vice-Minister of Communications	Tokyo

DIRECTION-GENERAL OF POSTS AND TELEGRAPHS.

Official.	Title.	Address.
Mr. T. Hatekeyma ..	Director-General	Tokyo.
Mr. K. Yoshino ..	Chief of Section of International Telegraphs	Tokyo.
Mr. E. Sonoda ..	Chief of Section of Inland Telegraphs	Tokyo.
Mr. T. Kosai ..	Chief of Section of Telephones	Tokyo.
Mr. S. Inada ..	Chief Engineer	Tokyo.

ELECTRO-TECHNICAL LABORATORY.

Official.	Title.	Address.
Mr. K. Takatsu ..	Director	—
Mr. E. Yohoyama ..	Engineer	Tokyo.

A large wireless station is now working in Formosa constructed by the Japanese Navy with materials produced in Japan. It was opened for service early in 1920.

The stations of Fukuoka and Fusan are being equipped for wireless telephony for communication across the Chosen Strait. This forms part of the Government plan for linking up the various islands of the Empire by Wireless.

New high power stations are under construction for public services to and from Europe and the Japanese colonies.

Traffic to and from America is exchanged between Iwaki and Kahuku (Hawaiian Islands), and with Bolinas (San Francisco).

The Fisheries and each Meteorological Observatory are being installed with wireless, and a new station in Osaka will soon be opened for press services with Europe and America.

The Japanese Government has also decided to erect wireless stations on all the islands along the coast.

A new telegraph training school has been erected at Meguro, a suburb of Tokyo, at a cost of 300,000 yen, and has been specially adapted for the training of radiotelegraph operators.

A fortnightly magazine devoted to the study of wireless telegraphy and telephony, and a monthly magazine named *Musen-no-Nippon*, or *Wireless Press*, are published by the Wireless Press Agency.

ADMINISTRATION.

The texts of the laws and regulations now in force are shown in accordance with the list below :—

A—Wireless Telegraph Law No. 26.

B—Wireless Telegraph Regulations No. 16.

C—Foreign Wireless Telegraph Regulations.

D—Regulations relating to Private Wireless Telegraphs.

E—Summary of Ordinance No. 98 of December 20th, 1923, regulating Private Broadcasting.

F—Ordinance No. 14 of March 24th, 1924. Broadcast Radiotelegrams.

WIRELESS TELEGRAPH LAW.
(Law No. 26, June 19th, 1915.)

A ART. 1. — All wireless telegraphs and telephones shall be under the control of the Government.

ART. 2.—Wireless telegraphs and telephones referred to below may be privately established with the permission of the responsible Minister, to be determined by an Order.

(i) Installations on board vessels with the object of assuring safety to navigation.

(ii) Installations on board vessels for communication between vessels engaged in a specific business belonging to one person, with the object of facilitating such business.

(iii) Installations on board vessels or on land for the exclusive use of private persons and communicating with telegraph offices for the dispatch and receipt of telegrams, but disconnected from public telegraph, telephone, wireless telegraph or wireless telephone communications.

(iv) Installations on board vessels or on land with the object of facilitating a specific business belonging to one person by mutual communication on land or between land and vessel, disconnected from public telegraph, telephone, wireless telegraph or wireless telephone communications, but to which the preceding clause is not applicable.

(v) Installations with the exclusive object of carrying out experiments in connection with wireless telegraphy or telephony.

(vi) Installations recognised as necessary by the responsible Minister, but not coming within the purview of the preceding clauses.

ART. 3.—Restrictions relating to private wireless telegraph and telephone apparatus, their installation and employment, together with the qualifications of persons operating private wireless telegraphs, will be determined by an Order.

ART. 4.—Private wireless telegraphs and telephones must not be used for purposes other than those for which they were established. Provided that their use shall not be prevented for signals of distress at sea, meteorological reports, time signals and in other cases, to be determined by an Order, where public utility is recognised by the responsible Minister.

ART. 5.—Wireless telegraphs and telephones installed on foreign ships may only be used in accordance with the provisions of Article 2. Provided that their use shall not be prevented for signals of distress at sea and for communications with telegraphs and telephone offices whilst on voyage.

ART. 6.—The responsible Minister may, by the issue of an Order, cause private wireless telegraphs or telephones to be used for the public service or for communications necessary for military purposes.

In cases coming within the purview of this Article the responsible Minister may, where deemed necessary, send officials to carry out the required operation.

ART. 7.—Where the responsible Minister deems it necessary in the interests of the public communication or on military grounds, he may withdraw his sanction from private wireless telegraphs or telephones or order changes in their equipment.

ART. 8.—Where the responsible Minister deems it necessary for the sake of public security, he may order a restriction of or suspension in the working of or the removal of instruments and accessories belonging to private wireless telegraphs or telephones or wireless telegraphs or telephones installed on foreign vessels.

In cases coming within the purview of this Article, the responsible Minister may, where deemed necessary, send competent officials to seal up instruments and accessories or to effect their removal.

ART. 9.—Where persons responsible for private wireless telegraphs or telephones have contravened this Law, Orders based on this Law, or provisions arising therefrom, the responsible Minister may withdraw his sanction from such wireless telegraphs or telephones or order the suspension of their operations.

ART. 10.—Where sanction has been withdrawn from wireless telegraphs or telephones established by private persons the dismantling of their apparatus and mountings will be required by order of the responsible Minister. This applies also in the case where private wireless telegraphs or telephones have ceased operations.

ART. 11.—Where private wireless telegraphs or telephones or wireless telegraphs or telephones established on foreign vessels have been called upon to deal with signals of distress at sea, such service must be refused.

ART. 12.—Immediately on receipt of signals of distress at sea, wireless telegraphs or telephones shall acknowledge them and report to the wireless telegraph or telephone most conveniently situated for purposes of rescue.

In cases coming within the purview of this Article, where request has been made for communication on specific matters, such communication should immediately be made regardless of the provisions of this Article.

ART. 13.—Where the responsible Minister has ascertained that any person has illegally set up a wireless telegraph or telephone, he may appoint competent officials to enter such establishment, inspect the apparatus and mountings thereof, effect the removal of instruments and accessories, and take other steps appropriate to the circumstances.

ART. 14.—The Government may, for the purpose of establishing wireless telegraphs or telephones to meet the needs of public communications, require the use of part of a vessel, and in case of necessity order special provision and equipment. Under the provisions of this Article a suitable rent for accommodation and actual cost of special provision and equipment will be paid by the Government on application.

ART. 15.—Matters relating to the administration of wireless telegraphs, wireless telephones, telegraphs, telephones, mails, postal money orders and post office savings, or signals of distress at sea, time signals and meteorological reports may as determined by an Order be communicated free of charge by the wireless telegraphs or telephones provided for the public service.

ART. 16.—Persons who have set up wireless telegraphs or telephones without permission, or have made use of wireless telegraphs or telephones set up without permission, or those who have made use of private wireless telegraphs or telephones after permission has been withdrawn will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding one thousand yen.

In cases coming within the purview of this Article, where wireless telegraphs or telephones have been placed at the disposal of other persons in return for money or commodities, they shall be confiscated, and the total sum of money or value of commodities already disbursed or handed over shall be collected.

ART. 17.—Persons using private wireless telegraphs or telephones for purposes other than those for which they were established will be subject to a fine not exceeding one thousand yen.

In cases coming within the purview of this Article, where wireless telegraphs or telephones have been placed at the disposal of other persons in return for money or commodities, they shall be confiscated, and the total sum of money or value of commodities already disbursed or handed over shall be collected.

Persons applying to and having messages sent by private wireless telegraphs or telephones will be subject to a fine not exceeding one hundred yen.

ART. 18.—Persons contravening the provisions of Article 5 or disobeying orders based on this Law for restricting or suspending the use, changing the equipment of or removing or dismantling wireless telegraphs or telephones will be subject to a fine not exceeding one

thousand yen. Where persons engaged in the business of wireless telegraphs or telephones have used them in opposition to Orders for their restriction or suspension, this provision shall apply also to such persons.

ART. 19.—Persons refusing without just cause to furnish the use of wireless telegraphs or telephones under the provisions of Article 6 or of vessels or failing to make special provision or equipment under the provisions of Article 14, will be subject to a fine not exceeding one thousand yen.

ART. 20.—Persons violating the secrecy of wireless telegraph or telephone messages coming under treatment at telegraph or telephone offices will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have divulged the secrets of messages under the provisions of this Article they shall be subject to imprisonment with hard labour for a period not exceeding two years or to a fine not exceeding five hundred yen.

The offences dealt with in this Article must be established by prosecution.

ART. 21.—Persons illegally evading charges connected with wireless telegraphs or telephone or causing other persons to evade them will be subject to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have committed acts referred to in the preceding paragraph, they will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding five hundred yen.

ART. 22.—Persons dispatching false communications by wireless telegraph or telephone with the object of causing harm to other persons will be subject to imprisonment with hard labour for a period not exceeding two years or to a fine not exceeding five hundred yen.

Persons dispatching false communications by wireless telegraph or telephone with the object of adversely affecting the public welfare will be subject to penal servitude for a period not exceeding five years or to a fine not exceeding one thousand yen.

Persons dispatching by wireless telegraph or telephone reports of shipping casualties when there are in fact no shipping casualties will be subject to imprisonment with hard labour for a period of not less than three months and not exceeding ten years.

Persons engaged in the business of wireless telegraphs or telephones who have committed acts referred to in the first clause will be subject to imprisonment with hard labour for a period not exceeding five years or a fine exceeding one thousand yen; in the second clause to penal servitude for a period not exceeding ten years; in the third clause to a term of imprisonment with hard labour of not less than one year.

ART. 23.—Where persons engaged in the business of wireless telegraphs have without just cause opened, damaged, concealed or thrown away telegrams sent by wireless telegraphy and coming under treatment at telegraph offices, or have delivered them to persons other than their proper recipients, they will be subject to penal servitude for a period not exceeding three years or to a fine not exceeding five hundred yen. Provided that cases coming within the purview of Articles 258 and 259 of the Criminal Code shall be dealt with according to that Code.

ART. 24.—Where persons engaged in the business of wireless telegraphs or telephones have, without just cause, neglected to deal with general public telegrams or communications necessary for military purposes, or have caused them to be delayed, they will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have, without just cause, failed to deal with reports of distress to vessels under the provisions of Articles 11 or 12, or have caused them to be delayed, they will be subject to a term of imprisonment with hard labour of not less than one year.

Persons obstructing communication of reports of distress at sea will similarly be dealt with under the preceding clause.

ART. 25.—Persons obstructing, or committing acts calculated to obstruct, general public communications or communications necessary for military purposes sent by wireless telegraph or telephone will be subject to penal servitude for a period not exceeding seven years or a fine not exceeding five hundred yen.

ART. 26.—Unconsummated attempts to contravene the provisions of the last ten Articles are punishable.

ART. 27.—Persons opposing, hampering or avoiding the competent officials appointed under the Law in the execution of their duty or failing to answer their questions or making false statements during the inspection required under the provisions of Article 13 will be subject to a penalty not exceeding one hundred yen.

ART. 28.—The provisions of the Telegraph Law, Articles 4, 5, 11 to 21, 23, 24 and 45, apply to wireless telegraphs and telephones employed for the general public service and communications necessary for military purposes.

SUPPLEMENTARY REGULATIONS.—The date of coming into force of this Law will be fixed by Imperial Ordinance.

The above Wireless Telegraph Law came into force on November 1st, 1915. Imperial Ordinance No. 186, October 25th, 1915.

WIRELESS TELEGRAPH REGULATIONS. No. 16.

DATED APRIL 8TH, 1908.

B ART. 1.—The expression "wireless telegram" means any telegram to be transmitted by wireless telegraphy.

ART. 2.—In the present Regulations the term "coast station" means any telegraph office on land equipped with wireless telegraph apparatus, and the term "ship station" means any telegraph office on board a ship equipped with wireless telegraph apparatus.

ART. 3.—Wireless telegrams shall bear the following abbreviated instruction:—

"RA" in the case of Romanised telegrams.

ART. 4.—The name of a coast station through which a wireless telegram destined for a ship station is to be transmitted shall be indicated within parentheses in the address of the telegram, but such indication shall not be counted in the number of words even in the case of a Romanised telegram.

In case such coast station cannot transmit the telegram, but there is another coast station which is able to do so, the intermediary of the latter may be resorted to. If a telegram destined for a ship can be delivered direct to

the addressee from a telegraph office on land, it may be delivered from such office without the use of wireless telegraphy.

(a) Wireless telegrams to be transmitted by way of intermediate ship station, with the exception of those handed in at a ship station, shall bear the following abbreviated instruction:—

“RS” in the case of Romanised telegrams.

Such intermediary transmission can in no circumstances be made more than once.

ART. 5.—If the sender of a wireless telegram destined for a ship station wishes to indicate the term during which his telegram is to be kept at the coast station, the number of days shall be inserted in the telegram as paid instruction.

Wireless telegrams without such instruction will be retained at the coast station for nine days from the day of handing in. However, in case the transmission of a telegram cannot be effected on account of the ship's station leaving out of the radius of action of the coast station or for any other reason, the telegram may not be retained, if the retention is deemed unnecessary.

ART. 6.—If the sender wishes to prolong the term of retention mentioned in Art. 5, application to that effect shall be made to the coast station before the expiration of the term. The same applies to further prolongation of the term. In such case, the term of retention will be nine days, unless specially indicated.

The application shall contain the date of handing in, number of characters or words, and the names of the sender and addressee of the wireless telegram.

The sender may make the application mentioned in paragraph 1 through the office of origin. If he wishes it notified to the coast station by telegraph, he shall pay the charge for a paid service telegram for the purpose.

ART. 7.—The transmission of a wireless telegram is to be effected when both the sending and receiving offices are within the guaranteed range of action of each other.

ART. 8.—In the case of ship's distress, wireless telegrams informing the name of the ship in distress the location and condition of the doomed vessel and any other particulars necessary for rescue, shall be treated by coast or ship station with absolute priority suspending all other communications.

ART. 9.—Paid service telegrams concerning enquiry, rectification, and stoppage of a wireless telegram to which reply is required can be exchanged only between telegraph offices on land.

ART. 10.—“Urgent telegrams,” “redirected telegrams,” and “telegrams with acknowledgment of receipt” are admissible between telegraph offices on land.

The sender of a wireless telegram with acknowledgment of receipt will be notified of the date and time at which the coast station has transmitted the telegram to the ship station.

(a) Telegrams of the same text originating from the same ship station or from the same telegraph office on land, and passing through the same coast station, may be made a multiple telegram, so far as concerns the transmission between wireless telegraph stations or between telegraph offices on land, as the case may be, no matter whether the addresses of such telegrams be in different localities or they be served by different offices of destination. The telegram shall bear the following abbreviated instruction instead of that for an ordinary multiple telegram: •

“SM” in the case of Romanised telegrams.

Paragraph 2 of Article 4 is not applicable to the multiple telegram mentioned in the preceding paragraph when it is to be distributed to two or more ship stations, unless every copy of such telegram can be transmitted through the same coast station or delivered from the same telegraph office on land.

(b) Reply-paid wireless telegrams shall bear the abbreviated instruction for “reply paid,” “urgent reply paid,” or “collated reply paid” completed by the mention of the prepaid amount. If a prepaid amount is 60 sen in the case of *kana* telegrams, and 75 sen in the case of Romanised telegrams, the mention of the amount is not required.

ART. 11.—Wireless telegrams are subject to the following charge for the operation at a coast station or a ship station in addition to the ordinary telegraph charge. It is provided, however, that the ordinary telegraph charge is not levied on a telegram which is to be transmitted only by wireless telegraphy.

For Government and Ordinary Telegrams:

Coast Charge.—For a *kana* telegram, 20 sen up to fifteen characters; 5 sen for every additional five characters or less. For a Romanised telegram, 25 sen up to five words; 5 sen for every additional word.

Ship Charge.—Ditto.

For Press Telegrams:

Coast Charges.—20 sen for every fifty characters or fraction thereof.

Ship Charge.—Ditto

(a) The following charge is levied in the same way as mentioned in the preceding Article on a supplementary copy of a multiple wireless telegram.

For Government and Ordinary Telegrams:

Coast Charge.—For a *kana* telegram, 10 sen for a Romanised telegram, 15 sen.

Ship Charge.—Ditto.

For Press Telegrams:

Coast Charge.—One-half the charge for the original telegram.

Ship Charge.—Ditto.

(b) If, in the case where Paragraph 2 of Article 4 is applied, the amount paid fall insufficient, the deficiency is collected from the addressee. In the case of a multiple telegram the amount to be collected is divided by the number of copies, and the quotient shall be the sum collected from one addressee.

ART. 12.—Wireless telegrams are free from special charge applicable to telegrams handed out of the ordinary hours of duty.

ART. 13.—The following charges for a wireless telegram shall be refunded less the amount which had been appropriated for another charge:—

(1) The charges pertaining to the transmission by wireless telegraphy when not effected.

(2) The charges pertaining to the transmission on telegraph lines when not effected.

ART. 14.—An application for the refund of charges for a wireless telegram handed in at a ship station may be sent in through any telegraph office.

ART. 15.—The term of retention mentioned in Articles 5 and 6 is not reckoned in the period of delay giving rise to refunds.

ART. 16.—Matters not expressly provided for in this Ordinance are subject to the other regulations relating to inland telegrams. Provided that the Regulations relating to Telegrams,

Articles 71, 114, 121, 126 to 130, 146 to 148, 148 (vi) to 148 (x), Ordinance No. 46, issued by the Department of Communications in September, 1900, shall not apply.

(a) With the exception of Article 9 to Article 10 (b) and the proviso in Article 16, the regulations in this Ordinance shall apply in the treatment of connected service between wireless telegraphs and the reciprocal dispatch and receipt of telegrams on land. Provided that, if deemed necessary by the Department of Communications, charges for such service shall be specially fixed.

The treatment of and special fixing of charges for, wireless telegrams referred to in the preceding clause will be separately notified.

FOREIGN WIRELESS TELEGRAPH REGULATIONS.

C The following supplementary regulations came into operation on July 1st, 1913, and apply to all Japanese possessions:—

ART. 1.—Foreign wireless telegrams are understood to be those which are treated according to the regulations of the London International Radiotelegraphic Convention or to the regulations concerning the radiotelegraphic service concluded between the Government of the Empire and foreign Governments or companies.

ART. 2.—The rates to be charged for foreign messages through Japanese coast and ship stations are as follows:—

(1) Coast station rate, 24 yen (fr. 0.60) per word.

(2) Ship station rate, 16 yen (fr. 0.40) per word.

The coast station rate referred to in the preceding paragraph includes the rate applicable to the transmission on telegraph lines for wireless messages originating in or destined for the Japanese Empire or Southern Manchuria or for ship's stations and the Japanese telegraph service. As regards urgent wireless messages for transmissions over land lines, an extra 10 yen (fr. 0.25) will be charged.

ART. 3.—The rates to be charged for foreign radiotelegrams through foreign coast or ship stations will be indicated separately.

ART. 4.—The ordinary rate for foreign wireless messages accepted by a Japanese ship station for transmission through a foreign coast station will be fixed by the owners of the said foreign coast station.

ART. 4.—For the acknowledgment of receipt of foreign wireless messages handed in at a Japanese telegraph office and destined for a ship station and transmitted thereto through a Japanese wireless coast station, the rate for the acknowledgment of receipt of interior telegrams for transmission between Japan and Southern Manchuria will be charged.

ART. 6.—At the request of the receiver, or of the person empowered to receive messages for and on behalf of the receiver, wireless messages may be retransmitted only over Japanese land lines.

ART. 7.—When the Japanese coast station given by the sender of a foreign wireless message destined for a ship cannot transmit the said message it may be transmitted through another Japanese coast station, provided such station is suitable for the purpose. This provision also applies in case the Japanese ship station cannot transmit a foreign wireless message to a Japanese coast station mentioned by the sender and where another Japanese coast station exists and which is capable of performing the duty.

ART. 8.—Japanese ship stations cancel foreign wireless messages when they are not in a position to transmit the same to the corresponding stations.

ART. 9. (i)—Should a foreign wireless message be cancelled in accordance with Article 8, the sender shall be at once advised and the money paid by him returned without delay.

(ii) Foreign wireless telegrams passing between the Imperial [Japanese] Telegraph Office in Shanghai and Imperial ship stations through the intermediary of Imperial coast stations and, as circumstances require, ship stations may be entered in the Japanese language.

(iii) Article 3, Article 4, Clauses i and ii and Article 5, clause i, of the Wireless Telegraph Regulations, Ordinance No. 16 of the Department of Communications, issued in April, 1908, provide for foreign wireless telegrams in Japanese.

(iv) Reply prepaid foreign wireless telegrams in Japanese must be marked "reply prepaid" followed by the amount paid for reply.

(v) Foreign wireless telegrams dispatched or received at the places announced separately will be transmitted through the intermediary of telegraph offices specially indicated.

(vi) The treatment of foreign wireless telegrams in accordance with the preceding Article is subject to the general regulations relating to foreign telegrams.

ART. 10.—Matters not specially provided for in this Ordinance as regards Japanese telegrams, foreign telegrams in Japanese, and other items, are subject to the general regulations relating to foreign telegrams.

REGULATIONS RELATING TO PRIVATE WIRELESS TELEGRAMS.

D (Ordinance No. 46, Department of Communications, October 26th, 1915.)

ART. 1.—The words "disconnected from public communications" in clauses iii and iv Article 2, of the Wireless Telegraph Law mean that the location for fitting up private wireless telegraph apparatus must be outside the boundaries of direct telegram delivery or telephone subscription or on vessels on which no telegraph office is established.

ART. 2.—Wireless telegraphs set up in accordance with clause v, Article 1, of the Wireless Telegraph Law are limited to provision for experiments connected with the science and apparatus of wireless telegraphy.

ART. 3.—Permission will be given to the furnishing of vessels with aerial apparatus and its use for wireless telegraphy by private persons.

ART. 4.—The apparatus and equipment of private wireless telegraphs, except in specially indicated cases, will be required to conform with the following clauses:—

(i) The apparatus must be capable of transmitting eighty *kana* characters or twenty European words per minute.

(ii) The receiving apparatus must be capable of receiving messages transmitted on electric wavelengths of from 100 to 1,800 metres.

(iii) The power supplied to the transmitting circuit corresponding to the distance required to be reached in the daytime must not exceed the following standards (measured at the primary coil of the transformer or at some point corresponding thereto).

Required daytime distance.		Electric power.	
20 naut. miles, not exceeding	$\frac{1}{2}$	kilovolt	amps.
100 "	"	"	"
200 "	"	"	"
300 "	"	"	"
400 "	"	"	"
500 "	"	"	"

(iv) The electric waves should be pure and as little damped as possible. The installation must be capable of using waves of such length as may be specifically indicated between 100 and 1,800 metres.

ART. 5.—The establishment and maintenance of private wireless telegraphs required to be installed at certain telegraph offices in accordance with clause iii, Article 2, of the Wireless Telegraph Law will be carried out by the Communications Office having local jurisdiction or a first-class post office dealing with branch administrative business.

Persons establishing private wireless telegraphs under this Article must be responsible for the supply of and expenditure on articles required for their establishment in accordance with details furnished by the Communications Office having local jurisdiction or the first-class post office dealing with branch administrative business, and must further pay expenses of maintenance.

ART. 6.—Persons proposing to establish private wireless telegraphs must append to their application documents inscribed with particulars under the following headings, submitting the whole to the Minister of Communications. Changes occurring under headings (i) to (iv) must similarly be notified.

(i) The object of the installation and grounds for its necessity.

(ii) Site of installation (full address or name of vessel).

(iii) Plan of construction (nature of apparatus, method of mounting, height of electric standards [masts], electric power, distance required to be reached in the daytime, details of supplementary equipment where required).

(iv) Hours open for operation.

(v) Nature of vessel, gross tonnage, owners, course navigated, and regular port of mooring (the principal home port of anchorage should be taken as the regular port of mooring).

(vi) Time required for completion.

The site of installation on vessels under heading (ii) and the plan of construction under heading (iii) should be illustrated by separate drawings.

ART. 7.—Where changes have been made in details under headings (v and vi) of the preceding Article, they must at once be notified to the Minister of Communications. In the case where the regular port of mooring has been changed such change must be notified also to the Communications Office having jurisdiction over, or the head post office dealing with branch administrative business at, the former port of mooring.

ART. 8.—When the fitting up and construction of a private wireless telegraph have been completed, the fact must at once be notified to the Minister of Communications.

ART. 9.—When the Minister of Communication has received a report under the preceding Article, he will send inspectors to examine the apparatus and fittings, after which a licence will be granted. Provided that where a special inspection is not deemed necessary a licence may be issued forthwith. If deemed specially desirable by the inspectors under this

Article a temporary licence will be issued for the opening of operations by the private wireless telegraph concerned.

ART. 10.—When a private wireless telegraph establishment is to be closed up, a notification to this effect must be sent to the Minister of Communications seven days earlier. Similar notice must be given in the case of suspension of a private wireless telegraph establishment.

ART. 11.—When a private wireless telegraph establishment has been closed up, the aërials must be removed immediately and, unless special instructions have been given, apparatus specially pertaining to wireless telegraphy—dynamos, secondary electric batteries, distributing apparatus, electromotors, motor generators, transformers, electric standards, transmitters, receivers, meters, etc.—must be dismantled and removed within ten days. Where sanction to a private wireless telegraph has been withdrawn the same provision applies.

ART. 12.—When a change is made in the proprietorship of a wireless telegraph installation, a written application for permission jointly signed with both old and new names, must be submitted to the Minister of Communications.

Where, owing to succession on the decease of the proprietor or other causes, joint signatures cannot be obtained, a certificate to this effect must be appended to the application.

ART. 13.—The length of electric waves and the call signal to be adopted by a private wireless telegraph will be decided by the Minister of Communications.

ART. 14.—When a private wireless telegraph has been sanctioned by the Minister of Communications details of the installation under the following headings will be officially announced. This applies also to changes effected therein:—

(i) Name of person setting up installation.

(ii) Object of installation.

(iii) Site of establishment.

(iv) Call signal.

(v) Ordinary range of distance.

(vi) Method of fitting up.

(vii) Electric wavelength used.

(viii) Hours open for operation.

ART. 15.—Operators of private wireless telegraphs are required to possess the proper qualifications in conformity with the Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs. Provided that exception be made in the case of operators of private wireless telegraphs established in accordance with Clause v, Article 2, of the Wireless Telegraph Law, who have received the special sanction of the Minister of Communications.

ART. 16.—Proprietors of private wireless telegraphs must notify the Minister of Communications of all appointments or dismissals of operators in the employ. In the case of appointments, copies of antecedents forms, certificate of physical examination and certificate of eligibility awarded on qualifying examination for operators of private wireless telegraphs must be appended.

ART. 17.—Where the Minister of Communications has ascertained that an operator of a private wireless telegraph is incompetent in the performance of his duties he may order the dismissal of such operator.

ART. 18.—A private wireless telegraph establishment shall not begin operations until a licence or temporary licence has been received in accordance with Article 9.

ART. 19.—When a private wireless telegraph establishment has begun operations the Minister of Communications must at once be notified accordingly. Provided that when the installation is one set up in accordance with clause iii, Article 2, of the Wireless Telegraph Law, notification will be required seven days before the opening of operations.

This Article applies also to reopening of operations after notification of suspension has been made in accordance with Article 10.

ART. 20.—The employment of private wireless telegraphs is required to conform with the following paragraphs. Provided that exception be made in the case of communications falling within the purview of Articles 22 to 24.

(i) Only when not causing disturbance to messages sent by the general public or to military communications.

(ii) In the case of installations on vessels, only whilst on voyage.

(iii) In the case of installations set up in conformity with clause v, Article 2, of the Wireless Telegraph Law, only when not causing disturbance to communications from other wireless telegraphs.

ART. 21.—Communications sent by private wireless telegraphs must be in Morse symbols, and the method of transmission, except where special instructions are issued, must conform with the following provisions:—

(i) Before making a call, the receiver must be regulated to the best degree of perception to determine whether a message is already in transmission. A call must not be made until such message, if any, is completed.

(ii) When making a call the "begin communication" signal —●—●—●— must first be sent, followed by the call signal of the party signalled, repeated three times, then the introductory signal —●—●— followed by own call signal, repeated three times.

(iii) When the signalled party replies, he must send the "begin communication" signal —●—●—●— followed by the signalling party's call signal repeated three times, then the introductory signal —●—●— followed by his own call signal and the "clear for transmission" signal —●—●—. This applies also in the case of a reply to the call under provision vi.

(iv) When there is no reply from the signalled party to the call made under provision ii, repeat the signals in proper order three times at intervals of two minutes. If there is still no reply, allow fifteen minutes to elapse, then make the call again in the same manner.

(v) When communicating with the signalled party by means of the international shipping signals, continue the call by sending the international shipping signal PRB.

(vi) When wishing to detect a wireless message within own range, use the "Inquiry signal" —●—●—●—●— and make the call provided under (ii).

(vii) When the signalled party replies, begin the required message immediately, and at its ending send the "end communication" signal ●—●—●— and own call signal, followed by the "clear for transmission" signal —●—●—

(viii) When the signalled party has comprehended the message, he must immediately signify its receipt by sending the signal "understand communication" —●—●—●—

(ix) When mutual messages have been completed, both parties must exchange the "finished" signal ●—●—●— and their own call signals.

(x) When in the case of an experimental message sent out by a wireless telegraph established in accordance with clause v, Article 2, of the Wireless Telegraph Law the call signal of another party is not required, repeat own call signal three times and after ascertaining that there is no danger of hindering another message, begin the required communication, and at its ending send the "end of message" signal ●—●—●— and own call signal. Provided that such communication must not exceed twenty minutes in duration.

ART. 22.—When dispatching a signal of distress at sea by private wireless telegraph, the preliminary "ship in danger" signal, ●—●—●—●—●— should be repeated at frequent intervals according to circumstances followed by the name of vessel in distress, position, and details of conditions and other matters likely to facilitate rescue. If it is desired to get into touch with a specified wireless telegraph a continued series of the "ship in danger" signal ●—●—●—●—●— should be followed by the call signal of the station signalled.

ART. 23.—When a private wireless telegraph detects the "ship in danger" signal ●—●—●—●—●— accompanying a message of distress at sea, it must suspend all other messages and immediately reply, and report details in the order specified in the last Article to another wireless telegraph situated at the most convenient point for purposes of rescue. Provided that where the message of distress includes a request for specified action before transmitting the report or for specified items to be included therein, such request must be complied with.

In the case of a continued series of the "ship in danger" signal ●—●—●—●—●— being followed by the call signal of a specified station, only in the event of no reply being received therefrom should the responsive steps be taken prescribed in the last paragraph.

ART. 24.—When sending out by private wireless telegraph a necessary warning of danger to navigation, repeat the preliminary navigation alarm signal TTT ten times at short intervals, then transmit necessary details, after which, allowing an interval of ten minutes to elapse, repeat the alarm three times. When a private wireless telegraph detects the navigation alarm signal TTT accompanying a necessary warning of danger to navigation, it must suspend all other messages.

ART. 25.—A private wireless telegraph shall not be prevented in cases of messages coming under the provisions of the last three Articles only, from exceeding the prescribed limit of electric power or wavelength used. Provided that, immediately after such use, the prescribed limits shall be reverted to.

ART. 26.—When a telegraph office has sent out by wireless telegraphy the private "suspend communication" signal —●—●—●— all private wireless telegraph messages within such office's range of distance must be suspended until the private "renew communication" signal —●—●—●— is issued.

ART. 27.—A private wireless telegraph shall not be prevented, in the cases referred to below, from operating outside the objects for which it was established.

(i) When deemed necessary to exchange messages with other wireless telegraphs concerning communications coming within the purview of Articles 22 to 24.

(ii) When deemed necessary to exchange messages with other wireless telegraphs in connection with meteorological and time signals or the adjustment of apparatus.

(iii) When rendered necessary to communicate with a telegraph office equipped with wireless telegraph apparatus, following instructions issued by such office.

(iv) When deemed necessary to exchange messages with military wireless telegraphs to meet the requirements of military communications.

ART. 28.—When a private wireless telegraph has received a request from another wireless telegraph to exchange messages for the purpose of adjusting apparatus, it shall respond thereto, provided there is no danger of obstruction.

ART. 29.—The Minister of Communications shall specially instruct the Wireless Telegraph Inspection Bureau to test a private wireless telegraph with a view to ascertaining whether it is properly employed and whether its communications are in order.

ART. 30.—When sending instructions to a private wireless telegraph relating to its communications, the Wireless Telegraph Inspection Bureau will prefix to its call signal the wireless telegraph inspecting signal • — • • • — • in order to distinguish its message from general communications.

ART. 31.—Where an order is sent direct to an operator relating to the restriction or suspension of operations by the private wireless telegraph operated by him or the removal of its apparatus and accessories, the person responsible for the installation will be separately notified.

ART. 32.—When a vessel with a private wireless telegraph on board comes within the wireless telegraph range of a telegraph office it must briefly report to such office its direction and distance therefrom, together with the direction in which the vessel is moving. When about to withdraw from the range of such office a similar report must be sent.

ART. 33.—The person responsible for a private wireless telegraph must report to the Minister of Communications, at the same time giving details, on all circumstances falling under the following headings:—

(i) When special restrictions have been imposed on the equipment and operation of the wireless telegraph concerned in foreign waters. Provided that exception be made where such restriction has been officially announced.

(ii) When messages have been sent in accordance with Articles 22-24.

(iii) When cases of contravention of the Wireless Telegraph Law or the Regulations connected therewith on the part of a private or foreign wireless telegraph have been detected.

(iv) When matters have arisen calling for special attention in regard to the results of wireless telegraphy or other features.

ART. 34.—The person responsible for a private wireless telegraph must keep a journal and cause the operator to record therein the items coming under the following headings:—

(i) Time of beginning and end of messages, and wireless station signalled.

(ii) Nature of message.

(iii) The circumstances coming under Articles 27 and 33, and the steps taken in accordance therewith.

(iv) In the case of private wireless telegraphs established in accordance with Clause v, Article 2, of the Wireless Telegraph Law, the results of experiments.

(v) In addition to the matters under the above headings, references for future use.

Communication journals as prescribed in this Article must be preserved for fifteen months, counting from the month following that in which they are completed.

ART. 35.—The person responsible for a private wireless telegraph must affix in his operating room, where they can easily be seen, his certificate, together with copies of the penal clauses of the Wireless Telegraph Law and a list of the essential objects for which the installation was established.

ART. 36.—The Minister of Communications will from time to time specially send officials to examine reports, and documents connected therewith, on the apparatus mounting and operations of private wireless telegraphs, in such cases the officials concerned will carry proof of their competency.

ART. 37.—Documents to be sent in under the provisions of Articles 7, 8, 10 and 19 may be replaced by telegrams.

ART. 38.—Documents to be submitted under this Ordinance to the Minister of Communications, with the exception of those coming under the preceding Article, must all be passed through the Communications Office having jurisdiction over, or the head post office dealing with branch administrative business at, the place of a land installation or the regular port of mooring of a vessel having an installation.

Supplementary Regulations.

ART. 39.—The provisions of Articles 1 to 3, 5 to 14, 18 to 20, 22 to 38, apply to private wireless telephones, and the provisions of Articles 22 to 24, 26, 29 to 31 and 36 apply to wireless telegraphs or telephones installed on foreign vessels.

ART. 40.—This Ordinance comes into force on November 1st, 1915.

PRIVATE BROADCASTING BY WIRELESS TELEPHONY.

SUMMARY OF ORDINANCE No. 98 ISSUED BY THE DEPARTMENT OF COMMUNICATIONS,

DECEMBER 20TH, 1923.

E

Transmitting Licences.

The applicant for a licence to install a private broadcasting station employing wireless telephony must submit to the Minister of Communications a formal application accompanied by a prospectus stating his name, the location of the proposed station, the area included within the proposed range, the nature of the matter to be broadcast, the normal day and night ranges, the date for completion, drawings and plans of the proposed station, the estimated cost of construction, and the estimated receipts and expenditure.

Private broadcasting stations are classed under two categories:

(1) Long distance, with a normal range of less than 160 kilometres, having an input power not exceeding 1.5 kilowatts and using wavelengths of 360 to 385 metres.

(2) Short distance, with a nominal range of less than 30 kilometres, having an input power not exceeding 250 watts and using wavelengths of 215 to 235 metres.

The natural wavelength of the aerial must not exceed 250 metres; it must be stayed so

that the wavelength is not affected by swaying caused by the wind, and must be so guarded that it is not liable to injure man, beast or other object.—The earth system must be confined solely to the installation.

The transmitter must be installed in a suitable room to exclude extraneous sounds and to eliminate echoes, and the transmitted wave must be continuous and well modulated to conform with the sound wave.

The permission of the Minister of Communications must be obtained before making any alteration in the stations, in the nature of the matter broadcast, or for its suspension or discontinuation.

The licensee must give the Minister of Communications seven days' notice of his intention to start broadcasting.

The licence fees (unless otherwise provided for) shall be :

For long distance stations, 500 yen every fixed year.

For short distance stations, 300 yen every fixed year.

In the event of a broadcast licensee charging fees from listening-in subscribers, such charges must be submitted to and be approved by the Minister of Communications.

Every broadcast licensee must keep a record of the time of beginning and ending of each broadcast transmission, particulars of the matter broadcast, number of subscribers, person in charge of the station, and other matter in accordance with Articles 27 and 33 of the Regulations relating to Private Wireless Telegrams (see "D"). This record is to be preserved for 15 months.

Public notice must be given of the granting of a broadcasting licence in which the essential particulars are to be stated, and, in the event of any modification of the original terms being approved, these alterations must also be publicly notified.

Receiving Licences.

Application for broadcast receiving licences must be made to the Director of the Competent Communication Bureau (? chief post office) giving particulars of the proposed installation, and, in the case of ships, the name, gross tonnage, owners and regular ports of call, stating the broadcasting station to which the applicant wishes to listen, and accompanied by the written consent of the licensee of such broadcasting station. The receiver (unless otherwise sanctioned by the Minister of Communications), must be of a type examined and certified by the Electro-Technical Laboratory. The natural wavelength of the aerial must not exceed 150 metres, and the receiver must only be tunable to wavelengths of 200 to 250 and/or 350 to 400 metres. and must not be altered to receive other wavelengths. It must be so connected as not to cause any oscillation in the aerial circuit. The aerial must be efficiently protected against damage of contact with electric lighting, telegraph or telephone wires, and gas or other pipes which may be considered dangerous on account of fire must not be used for earth connection.

The fee for a receiving licence is 2 yen for every fiscal year.

The regulations controlling private wireless telegrams shall, whenever applicable, be considered as relating equally to wireless telephony.

F ORDINANCE No. 14, ISSUED BY THE DEPARTMENT OF COMMUNICATIONS, MARCH 24TH, 1924.

REGULATIONS RELATING TO BROADCAST RADIO-TELEGRAMS.

I.—Messages to be handed in every day for one year for the purpose of making them public on board a ship at sea may be treated as broadcast radiotelegrams, hereinafter called "broadcast telegrams," in accordance with the regulations of this Ordinance.

II.—A person who desires to despatch broadcast telegrams shall present an application for licence thereof to the Minister of Communications through the competent Communications Bureau, stating therein the following particulars. (When it is desired to modify matters falling under any of the following items, except item 9, after the licence shall have been granted, the same procedure shall be applicable).

1. The nature of messages.
2. Whether in Japanese or European language.
3. Number of characters or words to be broadcast.
4. The telegraph office where messages are to be handed in.
5. The station from which messages are to be broadcast.
6. Time at which messages are to be handed in.
7. Time at which messages are to be broadcast.
8. Wavelengths to be used in broadcasting.
9. Names of receivers and of ships to which messages are to be addressed, the steamship line, and the owner of the ships.
10. Code address of receivers (to be common to all receivers).

When modifications are made in the matters of Item 9, a notice thereof shall at once be given to the Minister of Communications through the telegraph office where the messages are handed in.

III.—When the application for licence referred to in the preceding article has been granted, a notice thereof shall be given to the applicant by the competent Communications Bureau.

Names of receivers of broadcast telegrams and their code addresses shall be notified to the public.

IV.—If the Minister of Communications deems it necessary, he may cause the sender to change the matters falling under Items 3 to 8 and 10 of Article II.

V.—When it is desired to change the number of characters or words to be broadcast, application must be made at least one month beforehand.

The number of characters or words to be broadcast may not be changed at the receiver's own convenience in the middle of a month.

VI.—The contents to be broadcast consist of the code address of the receiver and the text of the message.

VII.—Broadcast telegrams shall be written in plain language, Japanese or European.

VIII.—When messages are handed in after the lapse of the fixed time they cannot be treated as broadcast telegrams.

IX.—When messages are considered partly or wholly as an advertisement or a private communication, they will not be treated as broadcast telegrams.

X.—The number of characters or words of the broadcast telegrams actually despatched

may not exceed the authorised number of characters or words.

XI.—Broadcast telegrams must be written on a message form each as a single telegram, with a notification "Radio Broadcasting" in the column of the postage stamp, and the receiver's address shall be indicated by the code address.

XII.—Broadcast telegrams may be received even by a ship which has no Government wireless station established on board, or which is not authorised to send or receive, through its own wireless equipment, telegrams to or from Government telegraph offices, provided that it is included in the address of such telegrams.

XIII.—The tariff for broadcast telegrams comprises the following rates per telegram, and a monthly fee of 5 yen per ship.

Japanese telegrams.	European telegrams.	
Broadcast characters.	Broadcast words.	Charges per month.
Not exceeding 1,000 characters.	Not exceeding 200 words.	Y 140.00
1,500 "	300 "	Y 200.00
2,000 "	400 "	Y 260.00

XIV.—Accounts for broadcast telegrams shall be rendered every month, and on or before the 10th of the next month the telegraph office of origin shall notify the sender of the total amount of charges thus arrived at.

When the notification referred to in the preceding paragraph has been received by the sender, the payment of the charge must be made by him in currency to the telegraph office of origin on or before the 25th of that month.

XV.—When the opening or the giving up of handling of broadcast telegrams takes place in the middle of a month, the charge for that month shall be reckoned by the day. The same rule shall apply in the case of increases or decreases in the number of ships to which broadcast telegrams are addressed.

XVI.—The charges prescribed in Article XIII shall not be reduced even if the number of characters or words of broadcast telegrams actually despatched does not reach the authorised number of characters or words.

XVII.—The charges prescribed in Article XIII shall not be reduced or reimbursed even in cases where it has been impossible to receive broadcast telegrams owing to obstruction caused by the working of a Government ship station.

XVIII.—The reduction in the charge for broadcast telegrams shall be made, reckoning by the day, only in the following cases:—

1. In the case of cancellation of licence under Article XXI in the middle of a month, or of decreasing the number of characters or words of broadcast telegrams in accordance with Article IV, the sum covering the period on and after the date of the cancellation or of the decrease.

2. In the case of suspension of broadcast telegrams for three consecutive days or more owing to failure of the installation or other unavoidable circumstances, the sum covering the number of days so suspended.

XIX.—When the sender has failed to pay the charge on or before the date fixed under paragraph 2 of Article XIV, the handling of the broadcast telegrams shall be suspended as long as the non-payment continues.

When the handling of the broadcast telegrams has been suspended under the preceding paragraph for thirty days or more, or three times during one year, the broadcasting licence may then be revoked.

XX.—When the despatch of broadcast telegrams is to be discontinued, notice thereof shall be given to the Minister of Communications through the competent Communications Bureau at least fifteen days in advance.

XXI.—Should the Minister of Communications deem it necessary from the point of view of public interest or on account of interruption to public services, the broadcasting licence may be revoked.

XXII.—In cases where the licence is revoked under paragraph 2 of Article XIX, or the despatch of broadcast telegrams is given up under Article XX, within one year from the date on which the licence has been granted, the charges for broadcast characters or words for the remaining period of the year shall be collected in one sum.

XXIII.—Matters not provided for in the present regulations shall be subject to the provisions for the handling of press telegrams, with the exception of the provisions of chapter X of the Regulations relating to Telegraphs; Article III, Article IV (bis) and Article X to Article X (ter) of the Regulations relating to Wireless Telegraphs; Article VI, VII, paragraph 3 of Article XII and paragraph 3 of Article XVI of the Regulations relating to Press Telegrams.

This Ordinance shall come into force on the first of April, 1924.

KENYA COLONY AND PROTECTORATE.

(See Maps 25 and 28)

THE administration is conducted by a Governor and Commander-in-Chief, assisted by an Executive and a Legislative Council.

CONTROL.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
T. Fitzgerald	Postmaster-General	Nairobi.

ORGANISATION.

At present there are two radio stations open for public traffic in this territory—one at Mombasa and the other at Kismayu, in Jubaland.

Communication between Jubaland and Mombasa is maintained by means of the wireless service.

Licences have, so far, only been issued in respect of some half dozen experimental receiving stations, and only a small number of these latter are now being actually worked.

ADMINISTRATION.

Radiotelegraphy is administered under the following:—

A—Wireless Telegraphy Ordinance, 1913.

B—Experimental Licence issued thereunder.

WIRELESS TELEGRAPHY ORDINANCE, 1913.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. The expression "wireless telegraphy" means any system of communication by telegraph as defined by the Indian Telegraph Act, 1885, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may, whenever he shall deem it expedient to do so, licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Protectorate or on board any British ship registered in the Protectorate.

4. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Protectorate or on board any British ship registered in the Protectorate except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as the Governor shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding one thousand and five hundred rupees or to imprisonment of either description for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Attorney-General.

(2) If a Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him

to be used or intended to be used for wireless telegraphy therein.

6. (1) The Governor may make regulations for all or any of the following matters:—

(i) For prescribing the form and manner in which applications for licences under this Ordinance are to be made;

(ii) For prescribing the fees payable on the grant of any licence;

(iii) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Protectorate shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in the Protectorate or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) For prohibiting, except with the special or general permission of the Postmaster-General of the Protectorate, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the Protectorate;

(v) For prohibiting or regulating in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Protectorate, the use of wireless telegraphy on board such ships while in such water by such further rules as the Governor may see fit to make from time to time and either in all classes or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraphs (iii) (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the Governor that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy a licence for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any Regulations made thereunder

or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Ordinance and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine of seven hundred and fifty rupees.

(2) All convictions, forfeitures, and fines under this Ordinance or any Regulations thereunder may be had and recovered before a Magistrate of the first class, and every such Magistrate shall have jurisdiction to pass any sentence authorised by this Ordinance on any European or other non-native convicted of an offence against this Ordinance notwithstanding anything in any Ordinance or law limiting the jurisdiction of such Magistrate over Europeans and non-Natives.

9. The Wireless Telegraph Ordinance, 1908, is hereby repealed: Provided however—

(1) Every licence granted under the said Ordinance and in force at the commencement of this Ordinance shall be deemed to have been granted under this Ordinance.

(2) All Regulations made under the said Ordinance and in force at the commencement of this Ordinance shall be deemed to have been made under this Ordinance and shall continue in force until other provision is made.

LICENCE.

B

In exercise of the powers deputed to me under Section 7 of the Wireless Telegraphy Ordinance, 1913, I, Postmaster-

General of the Colony and Protectorate of Kenya, do hereby licence and authorise residing at to conduct experiments in wireless telegraphy, and for such purpose to import wireless telegraph apparatus and install the same at such place as the Postmaster-General shall approve subject to the conditions and restrictions following, that is to say:

1. All apparatus utilised pursuant to the provisions of this licence shall be used solely for the purpose of scientific study in wireless telegraphy, and in no case shall the licensee install apparatus capable of being used for the purpose of sending wireless signals, or use the receiving apparatus for the purpose of receiving either private messages or for any commercial telegraph traffic whatsoever.

2. This licence shall remain in full force and operation for from date hereof.

Given under my hand at Nairobi this, the day of , 192

Postmaster-General.

LATVIA

(See also Maps 3 and 9)

THE Government of Latvia, according to the Constitution of 1922, is republican, representative and democratic. It is composed of the Legislature, the Executive and the Judicature. The Legislature is the National Assembly ("Saeima"), and the Executive are the President of the Republic and the Cabinet of Ministers.

CONTROL.

The control of wireless telegraph operations, except military and naval stations, is in the hands of the Director-General of Posts and Telegraphs, assisted by the Central Wireless Section of the Department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Eduards Kadikis	Director-General of Posts and Telegraphs	Riga
Janis Linters	Chief of Central Wireless Section..	Riga

It is proposed to erect a broadcasting station at Riga early in 1925.

ORGANISATION.

At the present time the following wireless stations are in operation:—

Coast Stations (P.G.)	2
Coast Stations (Official)	1
Long Distance Fixed Station	1
Ship Stations (Commercial)	18
Central Receiving Station	1

There are no direction finding stations and no amateur licences. There are fifteen private receiving stations for time and meteorological signals and two schools—one for military and the other for private operators. An Amateur Radio Club has been established.

ADMINISTRATION.

Latvia was admitted to the International Radiotelegraphic Convention on January 1st, 1922.

- A—Law relating to the Establishment and use of Radio Stations.
- B—Regulations for Merchant Ships.
- C—Regulations for the Examination of Latvian Commercial Radio Operators.
- D—Form of Licence for the Installation of Wireless Apparatus on board ship.
- E—Form of Licence for Operating Wireless Apparatus on board ship.
- F—Regulations. Ship Stations in Latvian waters.

LAW CONCERNING THE ESTABLISHMENT OF RADIO STATIONS AND UPON MAKING USE OF THEM.

A 1. All radio stations on the territory of Latvia and on board ships and aeroplanes sailing under the flag of Latvia are managed by the State or subjected to the control and inspection of the Government..

NOTE 1.

All telegraphs, telephones or other apparatus of like nature, inter-communicating or sending out or exchanging signals by means of electromagnetic waves are considered to be radio stations.

NOTE 2.

The territory of Latvia constitutes the whole land territory of Latvia, the territorial waters of Latvia and the air over these territories.

NOTE 3.

The officials empowered by the Director-General of Posts and Telegraphs have the right to control all radio stations on board foreign ships coming into the territory of Latvia, to examine their certificates, licences and installations, and to ensure the observation of all Radiotelegraph International and Latvian regulations, both general and local, by that radio station.

2. No private person, corporation or Government institution in Latvia, on Latvian ships or aeroplanes, excepting the Ministry of Communications and the Ministry of War, has the right, without previous permission given by the Director-General of Posts and Telegraphs, to manufacture, provide, keep, establish or use radiotelegraphic or radiotelephonic stations, apparatus or parts.

3. The Director-General of Posts and Telegraphs may issue—in conformity with the present law and the 1912 London Radiotelegraphic Convention and other international treaties, already concluded or which will further be concluded,—detailed regulations for the use of all radio stations in Latvian territory excepting stations controlled by the Ministry of War. These regulations must be confirmed by the Minister of Communication.

4. In order to guarantee secrecy of correspondence or for the security of the State the Minister of Communication independently or at the request of the Minister of War is entitled to revoke, without explanation of the reasons, the permissions given or to close private radio stations. The owners must remove the apparatus and accessories installed in the time fixed by the Director-General of Posts and Telegraphs, failing which the Director-General of Posts and Telegraphs will do so at the expense of the owners.

Note.—All radio stations excepted those belonging to the Ministries of War or of

Communications are considered private stations.

5. In case of war or on the proclamation of the state of siege, the Director-General of Posts and Telegraphs is entitled upon request of the Minister of War to close all private radio stations on land, on board ship or on aeroplanes, or to put them under the control of the Ministries of Communication or of War. In such cases all private radio stations, apparatus and parts may be legally requisitioned for the use of these branches of Administration.

6. The mutual relations in radiotelegraphic questions between the Ministries of War and of Communications and the stations belonging to them (including private stations under the management or control of the Director-General of Posts and Telegraphs) are regulated by joint committees of these branches of Administration, their decisions have to be confirmed by the Ministers of War and of Communications. In case of dissent between the Ministers of War and of Communications the Cabinet of Ministers decides the question.

7. The stations belonging to the Ministry of War must observe the International Radio Convention and general telegraphic regulations, when transmitting signals of danger or warning, in communications with foreign states or exchanging general public correspondence.

8. To provide for the safety of navigation (on sea and in the air) the Minister of Communications, in agreement with the Ministers of War and of Foreign Affairs and, in conformity with the international treaties and conventions, may issue regulations for the compulsory fitting and the use of radio stations on Latvian vessels of different tonnage and type.

9. In cases of contravention of Article 2 of this law or the ordinances and regulations based on Articles 3 and 8 of the same law, the Minister of Communications is entitled to retract the permissions given and to close the stations. The transgressor may be sentenced by the Criminal Court to imprisonment (Penal Code, Article 20), or to a fine of 100-2,500 francs, or the two punishments jointly, and the Court has the right to confiscate all the radio stations, apparatus and accessories in his possession. If a person belonging to the crew of a vessel or aeroplane becomes liable for punishment, he is not allowed to leave the Latvian territory until he has deposited a security in currency.

10. This law annuls the regulation of October 28th, 1922 (the Governments News 1922, No. 247) concerning the installation and use of radio stations.

Signed: J. ČAKSTE,
President of the State.

Riga, June 4th, 1923.

Latvian or foreign vessels within the Latvian territorial waters are forbidden, without special authority, to use their transmitting apparatus except for the exchange of radiotelegrams.

- (a) In cases of distress or salvage.
- (b) With the nearest Latvian coast station.
- (c) With stations on ships more than ten nautical miles distant from the nearest Latvian coast station.

In the cases (b) and (c) of this Article, radiotelegraphic communication must cease immediately upon the request of any Latvian coast station which is included in the International List.

2. Within the Latvian ports where radiotelegraphic coast stations are established, and in other regions designated by the Government which are controlled by the nearest radiotelegraphic station, no station may be used even for the purposes covered by (a) of Article 1 unless it has a special authority for the other cases.

3. Application must be made to the Director-General of Posts and Telegraphs of Latvia for special authority to transmit in cases other than those above-mentioned.

4. Ships of war in Latvian ports may use their transmitting apparatus, in addition to cases of distress or salvage, provided they have previously obtained permission from the

Ministry of Foreign Affairs. Upon receipt of such permission, ships of war must always arrange with the chief of the nearest coast station the question of wavelength and times of transmission.

In other Latvian territorial waters, ships of war, if duly authorised, may use their radiotelegraphic station without restriction. Transmission must always cease upon request from any radiotelegraphic station of the Latvia Government.

5. Every ship in Latvian waters must strictly conform with the International Rules and local regulations.

6. In matters concerning radiotelegraphic stations on Latvian warships, the Director-General of Posts and Telegraphs arranges directly with the Minister of War.

7. These regulations remain in force while Latvia is not in a state of war, and relate only to ships from countries which are not in a state of war.

Riga, September 11th, 1893.

(Signed) ED. KADIKIS,
Director-General of Posts and Telegraphs.
(Signed) J. LINTERS,
Chief of Central Wireless Section.

Confirmed by the Minister of Communications,
September 13th, 1923.

MALTA

(See Maps 2 and 13)

Including Gozo.

THE Island forms the headquarters of the British Mediterranean Fleet. By letters patent dated April 14th, 1921, responsible government was established in Malta. The previously existing Council of Government gave place to a Legislature composed of two Houses—the Senate and Legislative Assembly.

CONTROL AND ORGANISATION.

There are four stations, two belonging to the Navy; one, which is open for public service to ships, belongs to the Eastern Telegraph Company; and the British Air Force Station at Calafra.

ADMINISTRATION.

Wireless telegraphy in the Colony is administered under the provisions of the Wireless Telegraphy Apparatus Ordinance, 1922 and the Merchant Shipping Wireless Telegraphy Ordinance, 1923. Regulations under these Ordinances have been made by His Excellency the Governor. The Ordinances and Regulations are printed below.

- A—Ordinance No. 11 of 1922, The Wireless Telegraphy Apparatus Ordinance, 1922.
- B—Conditions under which licence may be granted under Article 3 of above Ordinance.
- C—Ordinance No. 1 of 1923. The Merchant Shipping Wireless Telegraphy Ordinance, 1923.
- D—Government Notice No. 117, May 25th, 1923 (Amending Schedule).
- E—Government Notice, November 23rd, 1923 (Forms of Licence).

PLUMER, F. M.,

Governor.

6th June, 1922.

ORDINANCE No. II OF 1922.

A AN ORDINANCE enacted by the Governor of Malta in the exercise of the powers conferred upon him by His Majesty's Letters Patent dated the 14th of April, 1921, constituting the office of Governor and Commander-in-Chief of Malta.

To Control Wireless Telegraphy.

WHEREAS wireless telegraphy is a reserved matter under the provisions of the Malta Constitution Letters Patent, 1921, and it is expedient to make a law with regard to the possession of wireless telegraphic apparatus.

Be it enacted by the Governor as follows:—

1. This Ordinance may be cited as "The Wireless Telegraphy Apparatus Ordinance, 1922."

2. No person shall, without the written permission of the Governor, make, buy, sell or have in his possession or under his control, any apparatus for the sending or receiving of messages by wireless telegraphy, or any apparatus intended to be used as a component part of such apparatus; and no person shall sell or give any such apparatus to any person who has not obtained such permission as aforesaid, and any person having in his possession or under his control any such apparatus, whether with or without the permission of the Governor, shall on demand deliver the apparatus to the Governor or as he may direct, and if any person contravenes the provisions of this article he shall be guilty of an offence against this law.

3. The Governor may annex to any written permission as aforesaid such terms or conditions as he thinks fit and upon the breach of any such terms or conditions the person committing such breach shall be guilty of an offence against this law.

4. For the purpose of this law, any apparatus ordinarily used as a distinctive component part of apparatus for the sending or receiving of messages by wireless telegraphy or telephony shall be deemed to be intended to be so used unless the contrary is proved.

5. A person committing an offence against this law shall, on conviction, be liable to a fine not exceeding £50; and on a second or further conviction, to a fine not exceeding £100, or to imprisonment for a period not exceeding three months, or to both such imprisonment and fine; and on conviction of a first or other offence against this law the Court may, and on the recommendation of the Governor shall, declare the permission given to the person convicted to be cancelled and order the apparatus to be delivered up to the Commissioner of Police.

6. In this Ordinance, "Wireless Telegraphy" means any system of communication by means of electric signals or telephony without the aid of any wire connecting the points from and at which the messages or communications are sent or received.

Passed 6th June, 1922.

By Command,

ED. R. MIFSUD,

Clerk of the Nominated Council.

B CONDITIONS OF LICENCE GRANTED UNDER ARTICLE 3 OF ORDINANCE No. II OF 1922.

1. This permission may, by order of the Governor be withdrawn, modified or cancelled

at any time without previous notice. Such withdrawal, modification or cancellation shall not give the licensee or any other person whatsoever any claim for compensation, or remuneration for any loss, damage or default, arising therefrom, or any right to know the reason thereof.

2. The apparatus shall be kept at the address mentioned in the licence, and not removed therefrom for any reason without the permission of the Governor.

3. The said apparatus is to be used exclusively for receiving messages in the course of experimental or scientific work, and is not to be used for sending or transmitting any signals, signs, words or messages whatsoever, or for any commercial purpose.

4. The licensee shall observe scrupulously and absolutely the secrecy of all messages intercepted by the said apparatus whether such messages be in connection with any department of His Majesty's Service, or of a private or commercial nature, or a press message, and shall refrain from imparting directly or indirectly to any person any sort of information received by the apparatus or any part of such information, and shall ensure that such information is not conveyed in any way through his act, omission, neglect or default, or that of any person employed by him, or who assists him, or is for any reason present on, or has access to, the premises.

5. If the licensee at any time makes use of thermionic valves in connection with any apparatus possessed by virtue of this licence the receiving circuits of such apparatus shall be so loosely coupled as, in the opinion of the inspecting officer, to prevent interference with the communications of the Imperial Services, Wireless Telegraphy installations in Malta or Gozo.

6. The following wavelengths shall not be used in connection with the said apparatus:—1,300 metres, 1,900 metres, 1,680 metres.

7. The Governor, the Naval, Military or Air Force Authorities, or the Commissioner of Police, or any officer authorised by them or by one of them for that purpose, shall have power to inspect at any time, even without previous notice, the said apparatus in the presence of the licensee or his representative, for the purpose of ascertaining that the conditions of this licence are being observed. For this object any officer authorised as above shall have free access to the apparatus and to any part of it, and liberty to inspect, examine and use any instrument or device or any part thereof, as well as any books, papers or other materials pertaining to or used in connection with the same. Such officer, however, shall treat as secret and confidential, and shall not make any use whatsoever of any information by him obtained during or by reason of such inspection, except in so far as it is necessary for him to divulge it in the execution of his office or duty.

8. The grant of this permission shall not be held to entail on the Government, the Civil, Naval, Military or Air Force Authorities any responsibility whatsoever for anything done, suffered to be done, or omitted by the licensee or any one employed by him or acting for him, or assisting him, in the use or the working of the said apparatus and through which or by reason of which any liability whatsoever, civil or criminal, is at any time incurred. Nor shall the grant of this permission be held to exonerate the licensee from any such liability as herein mentioned, or in any way to diminish it, or to indemnify him in respect of any act, neglect or omission, which constitutes a breach of any

civil or criminal law or regulation in force at any time during the period of the validity of this permission.

9. There shall be payable for the grant of this permission such an annual fee as may be prescribed by regulations issued by the Governor under the Fees (Reserved Matters) Ordinance, 1922. Such fee shall be payable in advance at the office of the Lieutenant-Governor, The Palace, Valletta.

10. This permission is valid for twelve calendar months from the date upon which it is given but without prejudice to the provisions of condition 1 hereof.

PLUMER, F. M.,
Governor.
23rd January, 1923.

ORDINANCE No. I OF 1923.

C AN ORDINANCE enacted by the Governor of Malta in the exercise of the powers conferred upon him by His Majesty's Letters Patent, dated the 14th of April, 1921, constituting the Office of Governor and Commander-in-Chief of Malta.

Amended by Ordinance No. V of September 21st, 1923 (the amendments being printed hereunder in italics).

To Control Wireless Telegraphy on Ships.

Whereas Wireless Telegraphy is a reserved matter under the provisions of the Malta Constitution Letters Patent, 1921, and it is expedient for the peace, order and good government of Malta that provision be made therefor so far as ships registered in Malta are concerned.

It is enacted by the Governor as follows:

1. This Ordinance may be cited as "The Merchant Shipping Wireless Telegraphy Ordinance, 1923."

2. Every seagoing British ship registered in Malta being a passenger steamer or a ship of sixteen hundred tons gross tonnage or upwards shall be provided with a wireless telegraph installation and a licence to keep and use the same, and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the Rules made for the purpose under this Ordinance, and shall be provided with at least one or more certified operators and watchers, in accordance with such Rules.

3. The Governor may exempt from the obligations imposed by this Ordinance any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

4. The Governor shall make Rules prescribing the form and substance of licences to keep and use wireless telegraphy installations, the nature of the wireless telegraph installation to be provided, the services to be maintained, and the number, grade and qualifications of the operators and watchers to be carried, and providing for the examination of operators and watchers in cases where necessary, and for fees payable in respect of such examination. Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914.

5. A surveyor of ships or a wireless telegraphy inspector appointed by the Governor may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Ordinance, and with

any Rules from time to time made thereunder, and for the purpose of that inspection shall have all the powers of a Board of Trade inspector under the Merchant Shipping Acts, 1894 to 1916. The Governor may by Rule made under this Ordinance prescribe for the payment of a fee for such inspection.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated by the said Surveyor or Inspector in writing to the Collector of Customs, and any ship which may seek to obtain a clearance or transire shall be detained until a certificate under the hand of any such surveyor or inspector is produced by the Master of the ship to the Collector of Customs to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Ordinance and with any Rules from time to time made thereunder.

If the surveyor or inspector is satisfied that a ship is properly provided with an installation and operators and watchers as required by the provisions of this Ordinance or of any rules made from time to time thereunder he shall forthwith inform the Collector of Customs in writing that the ship is so provided and shall give a certificate under his hand to the same effect to the owner or master of the ship.

6. The licence to keep and use a wireless telegraphy installation required by Article 2 of this Ordinance may be issued by the Governor to the owner of a ship or his agent applying for the same so soon as the Governor shall have received from the surveyor or inspector the certificate aforesaid. The said licence shall be valid for twelve calendar months.

7. Every seagoing ship registered in Malta which is provided with a wireless telegraph installation shall, whether the foregoing provisions apply to it or not, obtain a licence from the Governor of Malta to keep and use such installation. The Governor may by regulations made from time to time prescribe the form, substance and duration of such licences, the conditions on which they are to be issued and held, the fees payable therefor and the nature and character of the apparatus authorised by the licence.

8. If the provisions of the foregoing articles of this Ordinance or of any Rules from time to time made thereunder are not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted before the Court of Magistrates of Judicial Police.

9. The obligations imposed by this Ordinance shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by the Merchant Shipping (Convention) Act, 1914.

10. The foregoing provisions of this Ordinance shall, as from a date three months after the coming into operation of the obligations imposed by this Ordinance on British ships registered in Malta, apply to ships other than British ships registered in Malta while they are within any port in these Islands in like manner as they apply to British ships so registered.

11. In this Ordinance the expression "passenger steamer" means a steamer which carries more than twelve passengers, and "wireless

telegraphy inspector" means an officer appointed by the Governor for the purpose mentioned in Section 5 of the Ordinance.

"Wireless telegraph installation" means any apparatus used or capable of being used for the purpose of communication by means of electric signals without the aid of any wire connecting the points from and at which the messages or communications are sent or received."

References to or citations of the Merchant Shipping Wireless Telegraphy Ordinance, 1923 shall include reference to or citation of this Ordinance, and the two Ordinances shall for all intents and purposes be read as one.

Passed 23rd January, 1923.
By Command.

EDW. R. MIFSUD,
Clerk of the Nominated Council.

D

GOVERNMENT NOTICE No. 117,
MAY 25TH, 1923).
(AMENDING SCHEDULE OF TIMES OF
WATCH).

In exercise of the powers vested in the Governor by Article 4 of the Merchant Shipping Wireless Telegraphy Ordinance, 1923, His Excellency the Officer Administering the Government, has been pleased to amend the rules made by Government Notice No. 15, of January 23rd, 1923, regarding the services to be maintained in order to comply with the said Ordinance in the manner shown in the Schedule hereto.

Subject to this amendment the said Rules and Schedule thereto shall remain in force.

By Command,
EDW. R. MIFSUD,
Clerk of the Nominated Council,
May 25th, 1923.

SCHEDULE.

Zones.	Western Limit.	Eastern Limit.	Times of Watch for One Operator Greenwich Mean Time.	Times of Watch for Two Operators Greenwich Mean Time.
B. — Indian Ocean, Eastern Arctic Sea	Eastern Limit of Zone A.	Meridian of 90° E	from 4 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 18 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 24 h.
C. — China Sea, Western Pacific Ocean.	Eastern Limit of Zone B.	Meridian of 160° E.	from 2 h. to 6 h. 4 h. „ 6 h. 8 h. „ 10 h. 12 h. „ 14 h.	from 0 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 22 h.

GOVERNMENT NOTICE
NOVEMBER 23RD, 1923.
(FORMS OF LICENCE)

E

It is notified for general information that His Excellency the Governor, in the exercise of his powers under Section 4, of the Merchant Shipping Wireless Telegraphy Ordinance, 1923, has made the following rule:

There shall be three forms of licence to keep and use wireless telegraphy installations on ships. The said forms shall be those whereof copies signed by the Governor have this day been deposited in the Office of the Lieutenant-Governor. Form No. 1 shall be used in the case of ships compelled by law to carry wireless telegraphy apparatus; Form No. 2 in the case of ships not so compelled and Form No. 3 in the case of ships equipped with receiving apparatus only.

The substance of the said licences shall be that contained in the said deposited copies.

It is further notified that the forms of licence may be seen on application at the Lieutenant Governor's Office, The Palace, Valletta.

By Command,

EDW. R. MIFSUD,
Clerk of the Nominated Council.

November 23rd, 1923.

F

In exercise of the powers vested in the Governor by Article 4 of the Merchant Shipping Wireless Telegraphy Ordinance, 1923, His Excellency has been pleased to make the following rules regarding the nature of the wireless installation to be provided on ships, the services to be maintained, and the

number, grade and qualifications of the operators and watchers to be carried.

RULES REGARDING THE NATURE OF THE WIRELESS INSTALLATION TO BE PROVIDED, THE SERVICES TO BE MAINTAINED, AND THE NUMBER, GRADE AND QUALIFICATIONS OF THE OPERATORS AND WATCHERS TO BE CARRIED ON MERCHANT SHIPS UNDER THE PROVISIONS OF THE MERCHANT SHIPPING WIRELESS TELEGRAPHY ORDINANCE, 1923.

Interpretation.

I. The number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

Clauses 2 to 10 and the Schedule of Times of Watch for Ships required to carry one or two operators are practically identical with the terms of the Merchant Shipping (Wireless Telegraphy) Rule 1920 in force in Great Britain, with the exception that in Clauses 8 and 9 for the words, "THE BOARD OF TRADE AND THE POSTMASTER-GENERAL" in the British Rules, read "THE GOVERNOR" in Maltese Rules, and in Clause 10 for the words "THE POSTMASTER-GENERAL" read "THE BRITISH POSTMASTER-GENERAL."

II. The Governor may grant certificates to operators and watchers and may accept certificates granted to operators by the Government of any part of His Majesty's Dominions, or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force.

MAURITIUS

(See Maps 25 and 33.)

THE Administration of the Colony and its dependencies is vested in a Governor, assisted by an Executive Council and a Council of Government.

A new station was opened at Rose Belle in March, 1924.

ADMINISTRATION.

The legislation affecting Wireless Telegraphy in Mauritius, originated by an Ordinance (No. 33) issued in 1903, was amended by the "Wireless Telegraphy" (Amendment), Ordinance (No. 25), of 1912. These have since been consolidated by Ordinance No. 11 of 1913, and three sets of Regulations have been framed thereunder, as follows:—

- A**—Ordinance No. 11 of August 22nd, 1913 (to Consolidate the Laws on Wireless Telegraphy).
- B**—Regulations framed under Ordinance No. 11 of 1913 (Art 4) (August 22nd, 1913).
- C**—Additional Regulations respecting the transmission of messages by Wireless Telegraphy.
- D**—Regulations governing the transmission of messages by Wireless Telegraphy through Rose Belle Station to and from Merchant Ships at sea.
- E**—Regulations, March 24th, 1924, concerning Wireless Telephone Transmitting Stations.

ORDINANCE No. 11.

August 22nd, 1913.

A Be it enacted by the Governor, with the advice and consent of the Council of Government, as follows:—

1. *Definition of "Wireless Telegraphy."*—In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received; Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. *Licence for "Wireless Telegraphy."*—(1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

3. *Apparatus aboard ships.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

4. *Regulations.*—(1) The Governor in Executive Council may from time to time make regulations for carrying into effect the purposes of this Ordinance.

(2) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control

over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any licence granted under this Ordinance he may grant a search warrant to any police officer or any person appointed in that behalf by the Inspector-General of Police and named in the warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. *Penalties.*—Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable to a fine not exceeding five hundred rupees (Rs. 500) and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

7. *Repeal Clause.*—Ordinances No. 33 of 1903 and 25 of 1912 are repealed.

8. *Short Title.*—This Ordinance may be cited as "The Wireless Telegraphy (Amendment) Ordinance, 1913."

Passed in Council at Port Louis, Island of Mauritius, this twenty-ninth day of July, One thousand nine hundred and thirteen.

B REGULATIONS FRAMED UNDER THE WIRELESS TELEGRAPHY ORDINANCE No. II OF 1913

ARTICLE 4.

1. Apparatus for wireless telegraphy on board a merchant ship shall not be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

2. Apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall not be worked in such a way as to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

3. In these regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval station and any other wireless telegraph station whether on shore or on any ship.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. Any person who shall offend against any of these Regulations shall be liable to a fine not exceeding five hundred rupees (Rs. 500), and any apparatus for wireless telegraphy in connection with which the offence was committed may be seized and forfeited.

8. The Regulations published under Government Notification No. 19 of January 25th, 1913, are hereby repealed.

Made by His Excellency the Governor in Executive Council at a meeting held on August 22nd, 1913.

C ADDITIONAL REGULATIONS RESPECTING THE TRANSMISSION OF MESSAGES BY WIRELESS TELEPHONY.

(MADE UNDER ARTICLE 4 OF THE WIRELESS TELEGRAPHY ORDINANCE No. II OF 1913.)

1. Telegrams for transmission to ships at sea will in all cases be held at the Wireless Station until the ship in question arrives within range, *i.e.*, telegrams will not be transmitted to a ship which is approaching the Island until

she has called the wireless station for the first time.

2. In the case of a ship going away from the Island the telegram will be transmitted immediately on receipt at the wireless station unless she is known to have already passed out of range. In this case and in all cases where the transmission of the telegram by wireless proves to be impossible, the sender will be informed by service advice from the post office at which he handed in his telegram, and will be refunded the wireless charges.

Made by the Governor in Executive Council at a meeting held on the twenty-sixth day of December, 1919.

D REGULATIONS GOVERNING THE TRANSMISSION OF MESSAGES BY WIRELESS TELEGRAPHY THROUGH ROSE BELLE STATION, TO AND FROM MERCHANT SHIPS AT SEA.

(MADE UNDER ARTICLE 4 OF THE WIRELESS TELEGRAPHY ORDINANCE No. II OF 1913.)

1. Messages received by Wireless Telegraphy from merchant ships at sea shall be handed in at Rose Belle Post Office by an officer or agent of the Wireless Station and shall be transmitted to any of the telegraph offices of the Colony for delivery to the addressee free of charge.*

2. Messages for transmission to merchant vessels at sea shall be accepted at any of the telegraph offices in the Colony subject to the following charge and condition:—

(a) The charge shall be at the rate of eighty cents of a rupee per word.

(b) The minimum number of words to be charged shall be ten.†

3. The rules and regulations for the acceptance and transmission of messages by wireless telegraphy shall be in accordance with the rules and regulations at the Mauritius Post Office and Telegraphs for the time being in force.

4. Messages in code will not be transmitted or received by wireless telegraphy.

5. Regulations published under Government Notices No. 94 of 31st May, 1919, and No. 47 of 25th February, 1920, are repealed.

Made by the Governor in Executive Council, at a meeting held on the ninth day of July, one thousand nine hundred and twenty.

Amended and Approved by the Officer Administering the Government at a meeting of the Executive Council held on the twenty-second day of August, 1922, and ordered to take effect from the 1st August, 1922.

WIRELESS TELEPHONE TRANSMITTING STATIONS.

E REGULATIONS MADE BY THE GOVERNOR IN EXECUTIVE COUNCIL UNDER ARTICLE 3 OF THE WIRELESS TELEPHONY ORDINANCE, 1924.

1. Applications for the establishment of any wireless telephone apparatus or installation shall be made to the Colonial Secretary.

2. The Colonial Secretary may grant a licence to any person of British nationality, possessing satisfactory references, for the establishment of any such apparatus or installation. No licence shall be granted to any minor.

3. No apparatus or installation shall be used except of a type approved by the Colonial Secretary.

* A charge of 12 centimes per word is now made.

† The minimum charge has now been abandoned.

The wavelength used in transmission shall be not more than 350 metres with a power not exceeding 100 watts, or as the Colonial Secretary may determine.

The extreme height of the aerial limit, and the total length of mutable wire, including leading-in wires, shall be as the Colonial Secretary directs.

4. (1) The transmitting station shall be in charge of a person who has satisfied the Colonial Secretary by examination that he has attained a sufficient knowledge of the adjustment of the apparatus or installation he wishes to use.

Such person shall be required to have a sufficient knowledge of the regulations of the International Convention, in so far as they relate to interference.

(2) All transmitting stations shall be provided with a receiving apparatus or installation.

5. (1) The Colonial Secretary shall have the

absolute control of all stations installed, and such stations may be inspected or closed by any officer deputed by him, as may be required.

(2) The officer deputed by the Colonial Secretary shall have power to check the "tuning" of any apparatus or installation. No person shall interfere with any such apparatus or installation after each "tuning" shall have been so checked.

6. Any breach of any of the provisions of these regulations shall be punishable by a fine not exceeding Rs. 500, and the apparatus or installation in respect of which any such offence is committed shall be liable to confiscation.

Approved by the Governor in Executive Council at a meeting held on March 24th, 1924.

E. JULIENNE,
Clerk of the Executive Council.

MEXICO

(See Maps 35, 38, 43 and 44.)

THE Republic of Mexico, with a President at its head, is divided into 28 states, two provinces (territorio), and a federal district.

CONTROL.

The wireless service is worked exclusively by the Federal Government, presided over by the Secretariat of Communications and Public Works. The direct control is in the hands of the Radio Department of the Dirección General de Telégrafos Nacionales.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY:

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Amado Aguirre, Engineer ..	Secretary of Communications and Public Works	Mexico.
Antonio Gonzalez Montero ..	Director-General of National Telegraphs	Mexico.
Raymundo Sardenata ..	Chief of the Radio Department	Mexico.

ORGANISATION.

Private installations are allowed on the conditions established by the Dirección General de Telégrafos Nacionales authorised by the Secretariat of Communications and Public Works as long as the Decree promulgated on October 19th, 1916, is not violated. The radiotelegraphic stations open for public service to ships are 13 in number.

There are at present no radiotelegraphic arrangements in connection with aviation. Time and weather signals combined with "Shipping Advice" services are sent out from the coastal wireless stations daily.

ADMINISTRATION.

National Radiotelegraphic Laws are being drawn up. The only extant decree relative to radiotelegraphy runs as follows:—

A—Decree of October 19th, 1916.

B—Use of Wireless Apparatus at the Port of Tampico.

A ART. I.—The establishment and exploitation of Radiotelegraphic Stations is forbidden in the Mexican Republic except under the express authorisation of the Federal Government, which can only accord it on the terms and under the conditions which are contained in the Regulations attached to the said Law.

ART. II.—Anyone who without the authorisation of the Federal Government establishes a Radiotelegraphic Station shall be liable to a penalty of 500-1,000 pesos, or imprisonment

from 1 to 11 months, or shall suffer a combination of both penalties in accordance with the seriousness of the offence. Moreover, all apparatus, machines, and accessories forming part of the installation shall be sequestered for the benefit of the State.

ART. III.—If any corporation which installs a Radiotelegraphic Station be a company or any other responsible body, direct responsibility with regard to the infraction of this law is vested in the person of the directors, agents or administrators.

ART. IV.—Any persons who make use of a Radiotelegraphic Station installed without the authorisation of the Federal Government shall be liable to a punishment of half the penalty enacted in ART. II preceding.

ART. V.—Any persons who make use of a Radiotelegraphic Station without the authorisation of the Federal Government, or who intercept a communication between Public Departments, or who divulge its contents, shall be liable to the penalty which is contained in ART. 770 of the Penal Code of the Federal District.

ART. VI.—This Law enters into operation from the date of its publication.

B In accordance with Article 8 of the London Convention, which requires that "The working of radio stations shall be organised as far as possible so as not to disturb the working of other radio stations," and Article XLVI, Service Regulations affixed to the

International Radiotelegraphic Convention of 1912, which requires that "The exchange of correspondence between shipboard stations shall be carried on in such a manner as not to interfere with the service of the coastal stations, the latter, as a general rule, being accorded the right of priority for the public service."

It is notified that American vessels when anchored in the port of Tampico, must not engage in the transmission of wireless messages to other American ships and to coastal stations in the United States at all times. Certain hours have been set apart for this purpose so as not to inconvenience Mexican stations at or near Tampico, and it has been requested that such vessels, while in the port of Tampico, confine their wireless operations to the hours specified for that purpose by the Mexican authorities.

Operators on ships arriving at Tampico should ascertain from the Mexican Radio Station at that port (XAJ) during what hours they may use their transmitter while at anchor in the harbour.

MONACO

MONACO is a department of France, but a Principality with Prince Louis the reigning monarch.

ADMINISTRATION.

There is no commercial wireless telegraphy and telephony in the State. Private installations are regulated by the decree printed below.

A—Decree ruling the conditions of the establishment and use of radiotelegraphic apparatus designed solely to receive time and meteorological telegrams.

ORDER.

A We, Ministers of State of the Principality,

Considering the agreement between the Government of the Principality and the French Government, resulting in an exchange of letters on April 12th, 1921.

Considering the deliberations of the Government Council on March 19th, 1921, and March 8th, 1922.

DECREE

The conditions ruling the establishment, use and employment are fixed as follows by such persons in the Principality of the radiotelegraphic stations designed solely to receive time signals and meteorological telegrams.

ART. 1.—Applications for licences must be addressed to the Minister of State. The application must indicate the precise spot where the station will work and furnish a description of the apparatus employed.

ART. 2.—The licence is granted by the Minister of State.

ART. 3.—The receiving stations endorsed in Article 1 can only be used for the receipt of time signals and meteorological telegrams. All transmission of signals is formally prohibited.

ART. 4.—The contents of radiotelegrams, other than meteorological ones, which would eventually be collected by the authorised receiving stations, must not be written down nor made known to anyone outside the officials appointed by the Administration, or of competent legal police officers.

No use whatever shall be made of these telegrams.

ART. 5.—The Administration reserves the right to subject the receiving stations to such control as seems proper.

ART. 6.—The State will be under no responsibility on account of the use of the receiving

stations of wireless telegraphy, concession for which has been granted.

ART. 7.—The concessionaires must notify the Minister of State of any modification which they propose to adopt in the installation of their station.

The Administration can, moreover, at any time, and for whatever reason, suspend or revoke the granted permissions, without having to pay any indemnity whatever or making known any motive for their decision.

These licences carry no privileges, and cannot be made an obstacle to any similar licences granted subsequently to any other petitioner whatever. They cannot be transferred to a third party without the express consent in writing of the Administration.

At the first application of the Administration, each licensee must immediately place his station out of working order.

ART. 8.—The licensee must submit to all customary or fiscal arrangements resulting from the laws, rules and regulations which may happen to occur in the affairs of establishment or use of the wireless telegraphy stations.

ART. 9.—The licensee must pay a statistical fee fixed at 10 francs per annum, and for each authorised receiving station.

ART. 10.—The cost of stamps applied to the acts relating to the licence of time signal stations are to be borne by the licensee.

ART. 11.—The present order shall be deposited at the General Secretary's Office of the Minister of State, to notify whom it may concern.

ART. 12.—The Counsel to the Government for Public Works and Miscellaneous Affairs is charged with the execution of the present Order.

Executed at Monaco, at Government House, March 24th, 1922.

R. LE BOURDON,
Minister of State.

MOROCCO

(See Maps 2, 24 and 28)

BY the Franco Spanish Treaty of November 27th, 1912, Morocco was divided into three zones—French, Spanish and International (Tangier), respectively. The position of the International zone, hitherto somewhat vague, has now been defined by the Tangier Convention, shortly to be put into force.

(a) FRENCH ZONE.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
M. le Colonel Torquebiau	Directeur du Service des Transmissions ..	Résidence Général Rabat.
M. Walter	Directeur de l'Office des Postes Télégraphes et Téléphones	Résidence Général Rabat.

The Directeur du Service des Transmissions at the Residency General is in control, through a controlling station at the Residency General, of all wireless telegraph stations, Civil, Military, and Naval, in the French zone.

ORGANISATION.

The present organisation consists of the Shereefian Government stations at Tangier and Casablanca. These are for public use, the stations at Fez, Mequinez Marrakech, Agadir, and others, being solely for military use. The station at Mediuna is used only for the transmission of Navy and Protectorate official urgent messages.

A station for reception of messages from France has been opened at Rabat.

A station has been installed at Casablanca for aviation purposes.

Meteorological reports are transmitted four times daily from Mediuna (C.N.M.)

There is a direction-finding station at Chetaba.

ADMINISTRATION.

Wireless telegraph forms a Government monopoly.

Military wireless telegraph stations keep headquarters at Rabat informed as regards meteorological conditions for the use of the military Aeronautical Bureau.

The current laws and regulations governing wireless telegraphy consist of the Radiotelegraphic Convention of London, 1912.

No licences are given, and legislation for the grant of licences for working wireless telegraphy will not be undertaken.

Generally the French laws and regulations apply also to Morocco.

A law regulating wireless telegraphy for air service will shortly be issued.

(b) SPANISH ZONE.

CONTROL AND ORGANISATION.

At the present time there are in existence the following stations : Melilla (EGB), erected in July, 1908 ; Ceuta and Tetuan (EGD and EGK respectively), in July, 1911, and July, 1914 ; Larache (EGF), in December, 1911 ; and Alhucemas (EGO).

The officers in command of these stations are as follows:—

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Don Andres F. Mulero ..	Major of Engineers	Melilla.
Don Juan Reig y Valerino ..	Major of Engineers	Ceuta and Tetuan.
Don Pedro F. Bolaños ..	Captain of Engineers	Larache.

These are the only permanent wireless stations in the Spanish Zone. They are all under the jurisdiction of the Ministry of War, and are controlled by the Centro Electro-tecnico y de Comunicaciones (Engineers).

ADMINISTRATION.

Existing arrangements as regards meteorological information are the same as those for Spanish stations, the Madrid station being in charge of this service. No public facilities at present exist for the transmission or reception of messages.

The regulations governing these stations are the same as for Spain, and licences are given by the Centro Electro-tecnico y de Comunicaciones after the necessary examinations.

NEW CALEDONIA

(See Map 56.)

Including : New Hebrides, Loyalty Islands, The Isle of Pines, The Wallis Archipelago, The Huon Islands, Futuna and Alofi.

NEW CALEDONIA is under the administration of a Governor assisted by a Privy Council. The seat of administration is Nouméa, the capital, where there is a station under French control.

NEW HEBRIDES

The New Hebrides consist of four groups of islands, the Banks, Torres, Central, and Southern, administered by a Condominium established under a Convention between Great Britain and France, signed on October 20th, 1906, each country being represented by a Resident Commissioner. The seat of Government is at Vila, in the island of Efate. The laws of the two nations apply to their respective nationals in the group, as also such joint regulations as may be passed by the Resident Commissioners, or the High Commissioners for Great Britain and France under the authority of the Convention referred to. Natives are subject to regulations similarly enacted.

CONTROL AND ORGANISATION.

An agreement was arrived at in 1913 between the British and French Governments to establish a wireless telegraph station in the New Hebrides at the joint expense of the two Governments. The station at Vila was opened to the public in September, 1916.

Wireless telegraphy in the New Hebrides is practically a State monopoly. No provision is made for licences for private installations, which are prohibited, except with the permission of the administration. The Resident Commissioners are responsible for the control of radiotelegraphic activity in the islands. The only station at present is the land station of Vila, which is directly controlled by Government and is open for public service to ships.

There are no firms or companies engaged in the manufacture of wireless apparatus and no wireless societies or clubs. No aviation radio stations exist. A meteorological message is sent out daily to Fiji.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
The British and French Resident Commissioners		Vila

ADMINISTRATION.

Two joint regulations affecting wireless telegraphy have been issued by the Condominium Administration, the first dated January 7th, 1909, No. 1, "The Wireless Telegraph Regulation, 1909," the other the "Wireless Telegraph (Ships) Regulation, No. 3, of 1916."

The texts of these appear below:—

A—Regulation dated 1909.

B—Wireless Telegraph (Ships) Regulation, 1916.

A JOINT REGULATION TO REGULATE THE INSTALLATION OF WIRELESS TELEGRAPHY IN THE NEW HEBRIDES.

A 1. From the date of the passing of this regulation it shall be unlawful for any person to use or establish in any of the islands of the New Hebrides, including the Banks and Torres Islands, any apparatus or installation for the purpose of electrical communication by wireless telegraphy without a licence first obtained from the Resident Commissioners conjointly such licence to be granted on such terms and conditions as the Resident Commissioners aforesaid may from time to time determine.

2. Any person offending against the provisions of the preceding section or failing to comply with the terms and conditions of a licence when granted by the Resident Commissioners under the provisions of this regulation shall be liable to a penalty not exceeding twenty pounds and to forfeit any apparatus used or established for the purpose aforementioned.

3. Offences against this regulation shall be justiciable by the Joint Court contemplated by the tenth Article of the Anglo-French Convention of the twentieth day of October, one thousand nine hundred and six, and pending the establishment of such court by the court of the nation to which or to whose legal system the accused may belong.

4. This regulation may be cited as "The Wireless Telegraphy Regulation, 1909."

Published and exhibited at the Public Offices of the Resident Commissioners for His Britannic Majesty and for the French Republic this seventh day of January in the year one thousand nine hundred and nine.

A JOINT REGULATION TO CONTROL THE USE OF WIRELESS TELEGRAPH APPARATUS ON MERCHANT VESSELS IN THE NEW HEBRIDES.

B 1. From the date of the passing of this regulation all apparatus for wireless telegraphy on board merchant ships in the territorial waters of the New Hebrides shall be worked in such a way as not to interfere with:

(a) Naval signalling;

(b) The working of any wireless telegraph station lawfully established, installed or worked in the New Hebrides or the territorial waters thereof; and

(c) The transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraph on board a merchant ship shall be worked or used while the ship is in any of the harbours of the New Hebrides except with the joint special or general permission of the Resident Commissioners.

3. The Resident Commissioners shall have power to issue such further rules as to them may seem expedient for the control of wireless telegraphy on merchant vessels and for the censorship or messages transmitted from such vessels while in the territorial waters of the Group.

4. Any infraction of this regulation shall be punishable by the Joint Court with a money penalty of from one to twenty pounds and imprisonment for one day to one month or with one or other of these penalties.

5. This regulation may be cited as the "Wireless Telegraph (Ships) Regulation, 1916."

Published and exhibited in the Public Offices of the Resident Commissioners for Great Britain and the French Republic, at Vila, in the New Hebrides, this 30th day of October, 1916.

NEWFOUNDLAND AND LABRADOR

(See Map 37)

THE Executive is vested in a Governor aided by an Executive Council.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Hon. John R. Bennell, O.B.E.	Prime Minister and Colonial Secretary..	St. John's
Capt. Wm. C. Winsor	Minister of Marine and Fisheries ..	do.
W. J. Woodford	Minister of Posts and Telegraphs..	do.
Hon. Arthur Mews, C.M.G.	Deputy Colonial Secretary	do.
Mr. H. W. Le Messurier, J.P., C.M.G. ..	Deputy Minister of Customs	do.
Mr. Wm. Campbell	Secretary Postal and Telegraph Dept.	do.

CONTROL.

The Deputy Minister of Customs refuses clearance to any vessels of Newfoundland Register not licensed in conformity with the Acts, or whose operators are not in possession of provisional service certificates issued by the Minister of Posts.

ORGANISATION.

The Sealing Industry forms an important item in the industrial activities of the Colony, and the instalment of wireless equipment on the fleet of sealers, has been made compulsory.

Owing to the damage caused by floating ice to cables connecting the many neighbouring islands with the mainland, a number of small wireless stations have been erected to establish intercommunication between these islands and the inland Postal Telegraph System. These stations have proved invaluable in transmitting information regarding the movements of the seal patch and in connection with the pulp and paper industries in White Bay. The following stations are now in operation:—Flat Islands (AJ), St. Brendans (GJ) and Salvage (V) in Bonavista Bay; Rencontre (MF) in Hermitage Bay; Pass Island (WS) in Fortuna Bay; Campbellton (CM) and Exploits (EX) in Notre Dame Bay; Harbour Deep (MB) Hampden (HJ) and Westport (WA) in White Bay, all being of the 2 in. spark coil type and working a wavelength of 200 to 250 metres. There are also stations in operation on the islands of Ramea and Gaultois on the South Coast.

At the present time the following stations exist:—

Public service to ships	5
Government service only	1
Public inland traffic	9
Direction-finding service	1
Ship stations	17

ADMINISTRATION.

The general regulation of wireless is governed by the Posts and Telegraph Acts, 1891 to 1906.

A—Act of 1905 (Cap. VII).

B—Post and Telegraph Act, 1906.

C—Wireless Telegraphy (Steamers) Act, 1914.

D—Wireless Licence.

E—Provisional Certificate for Wireless Operators.

F—Amateur Experimental Licence.

THE ACT OF 1905, CAP. VII.

A This Act refers to taxes upon business transacted by telegraph and telephone companies within and in transit through the Colony. Clause 2, Section 2, reads as follows:—

A sum equal to one per cent. in manner hereinafter provided of the total amount received by or due to the company in respect of all telegraphic messages passing over the land lines of the company or transmitted or received by any wireless method of telegraphy to or from any place within this Colony from or to any other place within this Colony during a period of twelve calendar months ending on the first day of May of each year: Provided that this subsection shall not apply to messages which originate or are delivered in any place outside the Colony.

The first of such payments shall be made on the 30th day of June, 1906, in respect of the period of twelve months ending on the preceding first day of May. Section 4 of the same Clause (2) reads as follows:—

A sum of four thousand dollars (\$4,000) in respect of every wireless telegraph station or other means of communication by wireless methods of telegraphy between this Colony and any place, ship or vessel outside this Colony, for the time being belonging to or worked by or on behalf of the company which now is or hereafter shall be established in this Colony.

The first of such payments shall be made on the 30th day of June, 1906: Provided that if the Governor in Council is satisfied that any such wireless telegraph station or other such means of communication is established for the purpose only of reporting passing ships or vessels, he may dispense the payment of such last-named sum and discharge the company from liability therefor in respect of such station or means of communication.

Clause 1 (1) of the Act of June 15th, 1905, Cap. XXI, reads:—

Whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that the Government of the Colony shall have control over the transmission of messages over any

telegraph line, telephone line, or by any other form of telegraphy, it shall be lawful for the Governor in Council at any time to assume and for any length of time retain possession of any telegraph line, telephone, or any form of telegraphy in this Colony, and of all things necessary for the efficient working thereof, and may for the same time require the exclusive service of the operators and other persons employed in working such telegraph line, telephone, or any form of telegraphy; and the company or other proprietor of such telegraph line, telephone or any form of telegraphy, shall give up possession thereof, and the operators and other persons so employed shall, during the time of such possession, diligently and faithfully obey such orders and transmit and receive such despatches as they are required to receive and transmit by any officer duly authorised by the Governor in Council, and every company or other proprietor, operator or person violating any of the provisions of this section shall incur a penalty not exceeding one hundred dollars (\$100) for every refusal or neglect to comply with the requirements thereof, such penalty to be recovered by action in the name of the Minister of Finance and Customs, in a summary manner before a Stipendiary Magistrate or Justice of the Peace.

POST AND TELEGRAPH ACT, 1906.

B 1. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy, in any place in this Colony or on board any ship registered in this Colony, except under and in accordance with a licence granted in that behalf by the Postmaster-General, with the consent of the Governor in Council.

(2) Every such licence shall be in such form and for such period as the Postmaster-General may determine, and shall contain the terms, conditions, and restrictions on and subject to which the licence is granted, and any such licence may include two or more stations, places or ships.

(3) If any person establishes a wireless telegraph station without a licence in that behalf, or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be guilty of a misdemeanour, and be liable on conviction in a summary manner before a Stipendiary Magistrate to a penalty not exceeding fifty dollars, and on conviction on indictment to a fine not exceeding five hundred dollars or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Act except by order of the Postmaster-General.

(4) If a Stipendiary Magistrate is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship as aforesaid without a licence in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Postmaster-General, and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship, and to seize any

apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) When a fine under this Act is imposed by a Court, Judge or Magistrate, and the master or owner of any ship is ordered to pay the same and the same is not paid at the time and in the manner prescribed, the Court, Judge or Magistrate making the order may, in addition to any other powers they may have for the purpose of compelling payment, direct the amount remaining unpaid to be levied by distress and sale of the ship, her tackle, furniture and apparel.

(6) The Postmaster-General may make regulations for prescribing the form in which applications for licences under this Act are to be made, and, with the consent of the Governor in Council, the fees payable on the grant of any such licence.

(7) The expression "wireless telegraphy" means any system of communication by telegraph as defined in "The Post and Telegraph Acts, 1891 to 1904," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

2. This Act shall be read with and form part of "The Post and Telegraph Acts, 1891 to 1904," and the said Acts and this Act may be cited as "The Post and Telegraph Acts, 1891 to 1906."

WIRELESS TELEGRAPHY (STEAMERS) ACT.

C The following Act respecting the provision of wireless telegraphy on steamers engaged in the trade of Newfoundland was passed on September 4th, 1914:—

1. Every steamer to which this Act applies shall be provided:—

(1) With a wireless telegraph installation approved of by the Minister of Marine and Fisheries;

(2) With at least one qualified wireless operator approved of by the Postmaster-General;

(3) With a Morse signalling apparatus approved by the Minister of Marine and Fisheries;

(4) With at least one person on board capable of operating such signalling apparatus and of reading signals from other ships.

2. The wireless telegraphy installation provided on a ship to which this Act applies shall be maintained in good order and shall be attended to by an operator qualified as aforesaid in accordance with rules and regulations to be made by the Governor in Council under this Act for the purposes thereof.

3. No steamer to which this Act applies shall receive a clearance at any Custom House for the Seal Fishery or otherwise unless and until the Collector is satisfied that the provisions of this Act in respect of said steamer have been complied with.

4. If any requirement of this Act is not complied with in the case of any steamer to which this Act applies, the master or owner shall be liable for each offence to a fine of twenty-five hundred dollars, to be recovered in a summary manner before a Stipendiary Magistrate.

5. This Act shall apply to any steamer which ordinarily is engaged in prosecuting the Seal fishery from any port of this Colony, when engaged in the Seal fishery or when carrying more than sixty persons; and to any other vessel carrying passengers from or

within this Colony when named by the Governor in Council in a Proclamation to be published in the *Royal Gazette*.

6. Nothing in this Act shall affect the obligation to obtain a licence for a wireless telegraphy installation under "The Postal and Telegraph Acts, 1891 to 1906," or prevent the Governor in Council or other persons exercising a like control over such wireless telegraphy in times of war or otherwise as may be exercised in respect of other wireless telegraphy.

D SHIP LICENCE No.....
W. 19 19....

COLONY OF NEWFOUNDLAND.

"LICENCE TO USE WIRELESS TELEGRAPHY."

Issued in accordance with the provisions of the London Convention of 1912.

The herein named..... resident of..... is hereby licensed to establish and operate a wireless telegraph station on board the shipfor the term or period commencing on the first day of April, nineteen hundred and..... and terminating on the thirty-first day of March, nineteen hundred and.....and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of one dollar, being the licence fee for the privilege above named.

This licence is subject to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:

The expression "marine signalling" means signalling by means of any system of wireless telegraphy between two or more ships, between ships and shore stations and any other wireless telegraph station, or between shore stations and ships.

2. (1) The licensee shall not establish, install or operate any apparatus for wireless telegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto.

(2) No tolls, fees or other consideration shall be received, levied or collected by the licensee until the same have been approved of by the Government of Newfoundland.

3. (1) The licensee shall so operate the licensed apparatus as not to interfere with the working of any wireless telegraph station established in Newfoundland, or with marine signalling on the waters or territory of Newfoundland or neighbouring waters or territory.

(2) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Postmaster-General and with all rules prescribed by the Postmaster-General for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purposes of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station;

(b) With respect to any alternation of messages which the Postmaster-General may think necessary; and

(c) Generally with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not, without

the consent of the Postmaster-General, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

4. The licensee shall, if so required in writing by the Postmaster-General, cease to operate the licensed apparatus for such period (not exceeding.....hours in any one day) as may be specified by the Postmaster-General.

5. Subject to the provisions of this licence, and in accordance with the regulations issued from time to time by the Postmaster-General, the licensee shall transmit and receive messages by means of the licensed apparatus to and from any coast station or to and from any other ship without regard to the particular system of wireless telegraphy installed at such coast station or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise.

6. The licensee shall not be obliged to transmit and receive commercial messages by means of the licensed apparatus to and from a ship station on a ship registered in a country which does not adhere to the International Radiotelegraphic Convention, unless instructed so to do by the Postmaster-General in his regulations.

7. (1) If and whenever any Department of the Government shall require the licensee, his servants or agents to transmit, by means of the licensed apparatus, any message on His Majesty's service (including messages to and from ships of His Majesty's Royal Navy or Newfoundland or Canadian Government vessels), such messages shall have priority over all other messages, and the licensee, his servants and agents shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages, and the rates to be charged on such messages shall not exceed half the rates charged the ordinary public.

(2) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

8. The licensee shall, so far as possible, receive from all other stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

9. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and transmitted by marine signalling or by any system of wireless telegraphy.

10. All messages transmitted by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its places of origin and ultimate destination and such further particulars as the Postmaster-General shall from time to time reasonably require to be shown, messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed, and transcripts of messages and all other papers for such period as is from time to time prescribed by the regulations of the International Radiotelegraphic Convention, and such registers and message papers shall be open to the inspection of the Postmaster-General or his officers thereto authorised at the head office of the licensee, in between the hours of 10 a.m. and 5 p.m., on every day except Sunday or a public holiday.

11. The Postmaster-General or his officers

may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

12. The licensee shall prepare a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose by the Postmaster-General and shall forward the same to the Postmaster-General at the end of each month.

13. (1) The licensee shall observe at the station the provisions of the International Radio-telegraphic Convention as adhered to by His Majesty in respect of the Colony of Newfoundland and the detailed regulations from time to time made thereunder for carrying such provisions into effect.

(2) The licensee shall operate the licensed apparatus in accordance with any regulations which may be issued from time to time by the Postmaster-General.

14. Except with the consent in writing of the Postmaster-General the licensee shall not assign or sublet this licence.

15. The licensed apparatus at the said ship station shall be worked only by a person or persons holding a certificate or certificates issued by the Postmaster-General.

Certificates shall be granted to persons of such technical proficiency, and shall be in such form and subject to such conditions as the Postmaster-General may from time to time prescribe.

16. The licensee shall carry this licence on the ship on which the ship station is established under this licence, and also such documents as may be prescribed by the Postmaster-General, for the purpose of enabling the licensee to communicate with coast stations in accordance with the rules and regulations of the International Radiotelegraphic Convention of Berlin, 1906.

17. (1) If, and whenever, in the opinion of the Postmaster-General or any officer in command of one of His Majesty's ships of war, an emergency shall have arisen in which it is expedient for the public service that the Government shall have control over the transmission of messages by the licensed apparatus, it shall be lawful for the said Postmaster-General, by warrant under his hand, to direct and cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and, subject thereto, for such ordinary services as to the said Postmaster-General may seem fit, and in that event, any person authorised by the said Postmaster-General may enter upon the stations of the licensee, and take possession thereof and use the same as aforesaid.

(2) The Postmaster-General or any officer in command of one of His Majesty's ships of war may, when he considers such an emergency as aforesaid to have arisen, instead of taking possession of the stations of the licensee, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus, either wholly or partly and in such manner as he may direct, and such persons may enter upon the licensee's premises accordingly, or the said Postmaster-General or officer may direct the licensee to submit to him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages,

to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said Postmaster-General or officer may prescribe, and the licensee shall obey and conform to all such directions.

(3) In any such case as aforesaid, if the licensee shows that during the exercise of any of the powers aforesaid, his receipts for the licensed apparatus with respect to which the said powers have been exercised have been less than his receipts from the same source during a corresponding period, the Government shall pay to the licensee, as compensation for any loss of profit sustained by the licensee by reason of the exercise by the Postmaster-General of any of the powers hereby reserved, such sum as may be settled between the Postmaster-General and the licensee by agreement or as in case of difference may be determined by arbitration. Provided always that no such compensation as aforesaid shall be paid if and so far as the powers hereby reserved to the Postmaster-General are exercised for the purpose of preventing direct communication with any of His Majesty's enemies, and, save with the consent of the Postmaster-General, no such compensation shall be paid if and so far as the powers aforesaid are exercised for the purposes of preventing direct or suspected communication with any of His Majesty's enemies or of protecting the interests of His Majesty under the apprehension of impending war.

18. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Postmaster-General may by writing revoke and determine these presents, and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become void.

19. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General, from time to time, to establish, extend, maintain and work any system or systems of wireless telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Postmaster-General, from time to time, to enter into agreements for or to grant licenses relative to the working and user of wireless telegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Newfoundland, by means of wireless telegraphy, with or to any person or persons whosoever upon such terms as he shall, in his discretion, think fit.

20. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Postmaster-General under these presents may be under the hand of any authorised officer, for the time being, of the Newfoundland Postal Telegraph Department and may be served by sending the same by registered letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered letter addressed to the Postmaster-General, St. John's, Newfoundland.

.....
Minister of Posts and Telegraphs.

DEPARTMENT OF THE POSTAL TELEGRAPHS,
NEWFOUNDLAND.

Dated at St. John's this.....day of
.....19..

PROVISIONAL
WIRELESS OPERATOR'S CERTIFICATE.

This is to certify that the
E bearer
resident of
is a British subject and is certified by the
local Superintendent of the Marconi Wireless
Telegraph Company of Canada to have the
necessary technical proficiency for the position
of wireless operator having acted as such on
the steamerplying
upon the territorial waters of Newfoundland
from
to

He has subscribed to the Oath of Secrecy
and understands that this certificate is a
provisional one, valid for not more than six
months from the date of issue inscribed hereon.
Issued in accordance with the London
Convention, 1912, and the Wireless Telegraphy
(Steamers) Act, 1914, Newfoundland Legislature,
and regulations made thereunder.
General Post Office,

St. John's, Newfoundland.
.....day of
.....
*Minister of Posts and Telegraphs,
Newfoundland.*

Name of Station.	Normal Range.	Descrip- tion of Receiving Apparatus.	Wave- length.	Source of Power and Maximum Output.	Maximum Power taken by Transmitting Instruments.		Frequency of Alternator, if any.	Ship Charge.
					Volts.	Amps.		

AMATEUR EXPERIMENTAL LICENCE.
192.... LICENCE No.....

DOMINION OF NEWFOUNDLAND.

LICENCE TO USE RADIOTELEGRAPHY.

F Issued in accordance with the provisions
of the London Convention, 1912, and the
Post and Telegraphs Amendment Act,
1906, and these Regulations made thereunder.

The herein named.....
resident of
herein called the licensee, is hereby licensed
to establish and operate an experimental
radiotelegraph station situated at.....
.....for the term of one year
commencing on the.....day of.....
and terminating on the.....day of.....
and to install and operate at such station the
apparatus mentioned in the schedule hereto,
on payment of the sum of One Dollar (\$1)
being the licence fee for the privilege above
named.

This licence is subject to the said Act and
Regulations and to the following terms,
conditions and restrictions:—

1. In this licence, the term "Minister"
means the Minister of Posts and Telegraphs
service for the time being.

2. (1) The licensee shall not establish, install
or operate any apparatus for radiotelegraphy,
except the apparatus hereinafter called the
"licensed apparatus" specified in the said
schedule hereto, nor use wavelengths other
than those specified therein.

(2) The licensee shall work the licensed
apparatus solely for the purpose of conducting
experiments in radiotelegraphy and for no
other purpose whatever.

3. (1) The licensee shall so work the licensed
apparatus as not to interfere with the working
of any radiotelegraph station established in
Newfoundland or the territorial waters abutting
on the coasts of Newfoundland (whether on
shore or on any ship), by or for the purposes
of the Minister of any Department of His
Majesty's Government or for commercial
purposes and in particular with the sending
or receipt of any messages between or at radio-
telegraph stations established as aforesaid
on land and radiotelegraph stations established
on ships at sea.

(2) With a view to preventing such inter-
ference as aforesaid the licensee shall comply
with all directions which shall be given to the
licensee by the Minister and with all rules
prescribed by the Minister for observance by
his licensees:—

(a) With respect to all arrangements to
be adopted for the purpose of securing
syntonised apparatus or for enabling the
messages exchanged by means of the licen-ed
apparatus to be distinguished from those
emanating from any other radiotelegraph
station;

(b) Generally with respect to avoiding
interference between one radiotelegraph
station and another.

4. The licensed apparatus shall not, without
the consent of the Minister, be altered or modified
in respect of any of the particulars mentioned
in the schedule hereto.

5. (1) The coupling between the primary
and the secondary circuits of the oscillation
transformer shall not be closer than that which
gives a difference of 5 per cent. between the
mean wavelength and either of the two waves
emitted by the coupled circuits.

(2) The logarithmic decrement per whole
period, of the emitted waves, shall not exceed
two-tenths.

6. The licensee shall not divulge to any
person (other than the properly authorised
officials of the Government or a competent
legal tribunal) or make any use whatever of
any message coming to the knowledge of the
licensee and not intended for receipt by means
of the licensed apparatus.

7. The Minister or his officers may, from time
to time and at all reasonable times, enter upon
the herein licensed station, for the purpose of
inspection, and may inspect any apparatus
fixed or in use in such station, for the purpose of
sending and receiving messages by radiotele-
graphy and all other telegraphic instruments
and apparatus fixed or being in such stations
and the working and user of such apparatus
and telegraphic instruments respectively.

8. All apparatus used or intended to be used
by the licensee shall be so erected, fixed, placed
and used as not, either directly or by reason
of the working or user thereof, to interfere

with the efficient or convenient maintenance, working or user of any telegraphic line.

9. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

10. The licensed apparatus shall only be worked by a person, or persons, holding an Amateur Experimental Certificate of Proficiency in Radiotelegraphy.

11. The licensed apparatus shall be operated in accordance with the Regulations issued by the Minister and in accordance with such provisions of the International Radiotelegraph Convention as are applicable to such operation.

12. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

13. (1) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(2) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period as may be specified by the Minister.

14. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and thereupon these presents, and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become void.

15. Nothing in these presents contained shall prejudice or affect the right of the Minister from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to those hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working and use of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Newfoundland, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

16. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Postal Telegraph Service, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered

post letter addressed to the Minister of Posts and Telegraphs, St. John's Newfoundland.

.....
Minister of Posts and Telegraphs.
St. John's Newfoundland.

....day of.....192
Department of the Postal Telegraphs, St. John's,
Newfoundland.

Dated this.....day of.....192

SCHEDULE.

1. Name of station.....
2. Location
3. Call Signal
4. Classification of station under Regulation No.
5. Type of aerial
6. Natural wavelength of aerial
7. Transmitting wavelength
8. Decrement per complete oscillation
9. Characteristics of transmitting
10. Characteristics of receiver
11. Source of power
12. Maximum to be taken by transmitter
13. If A.C. number of cycles
14. Hours during which the station must not transmit.....
15. Stations with which the licensed stations may communicate.....

.....
Minister of Posts and Telegraphs.
Department of the Postal Telegraph Service,
St. John's Newfoundland.
Dated this.....day of.....192.....

SPECIAL REGULATIONS FOR AMATEUR EXPERIMENTAL STATIONS.

1. At amateur experimental stations the power used measured at the terminals of the transformer must not exceed $\frac{1}{2}$ kW.

2. The wavelengths which may be used vary with the distance between the licensed station and any commercial coast or land station or a route of navigation as follows —

For transmission :—

Class I—Station located within five miles of a commercial coast or land station or a route of navigation, shall not use a transmitting wavelength greater than 50 metres.

Class II—Stations located more than five but less than 25 miles from a commercial coast or land station or a route of navigation, shall not use a transmitting wavelength greater than 100 metres.

Class III—Stations located more than 25 but less than 75 miles from a commercial coast or land station or route of navigation, shall not use a transmitting wavelength greater than 150 metres.

Class IV—Stations located more than 75 miles from a commercial coast or land station or route of navigation, shall not use a transmitting wavelength greater than 200 metres.

3. A distinctive call signal shall be allotted to each station commencing with the figure "8," e.g., 8AA, 8AB, which signal must be sent not less than three times at the termination of every transmission.

4. The Regulations of the International Radiotelegraph Convention, where applicable, be observed by the station.

5. The station must take every precaution to prevent interference with the working of other stations.

6. The station, when operating, must listen for the signal "STP" which will indicate that an amateur experimental station is interfering with commercial business.

7. The latter signal will only be made use

of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STF" will, whenever possible be preceded by the call signal allotted to the amateur experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, all amateur experimental stations will cease to operate

until the Government station gives the signal "Cancel STP."

8. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken. At all other times, such as when the spark is being tested or sending is being practised, the aerial must be disconnected.

NEW ZEALAND

(See Maps 55 and 56.)

Including : Auckland Island, Chatham Islands, The Cook and other Pacific Islands, Kermadec Islands and Western Samoa.

THE Dominion of New Zealand consists of three main islands in the South Pacific Ocean, known as the North, South, and Stewart Islands. The New Zealand Government also administers the Cook Islands Group, Niue Island the former German possession of Western Samoa, and, conjointly with the Imperial Government and the Government of Australia, the Island of Nauru.

The constitution rests upon the Act of 1852, under which the Executive authority is vested in a Governor-General assisted by a Council of Ministers with a legislature of two houses.

CONTROL.

The Post and Telegraph Department is responsible for the administration of wireless telegraphy in New Zealand. The permanent head of this Department is the Secretary of the General Post Office at Wellington.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Hon. Mr. J. G. Coates	Postmaster-General and Minister of Telegraphs	Wellington.
Mr. A. T. Markman	Secretary, General Post Office	Wellington.
Mr. E. A. Shrimpton, M.I.E.E. ..	Chief Telegraph Engineer	Wellington.
Mr. G. McNamara	First Assistant Secretary	Wellington.
Mr. J. Robertson	Second Assistant Secretary	Wellington.
Mr. A. Gibbs, M.I.E.E.	Deputy Chief Telegraph Engineer ..	Wellington.
Mr. F. T. R. Johnson	Controller of Savings Banks and Accounts	Wellington.

ORGANISATION.

A short account of the earlier history of the development of wireless telegraphy in New Zealand may be found in the YEAR BOOK for 1923. At the present time four stations in New Zealand are open for public service with ships, and at a fifth station a listening service for distress or other urgent calls from ships is maintained.

PRIVATE STATIONS, AMATEUR, AND EXPERIMENTAL.

To meet the growing demand for permission to experiment in wireless telegraphy, the Department issued provisional permits authorising the use of receiving apparatus for experimental or instructional purposes, the conditions of the permits being designed to prevent interference with the conduct of public wireless telegraph work. Regulations governing the issue of licences for amateur, experimental and broadcasting stations were gazetted on January 18th, 1923, the provisional permits being then recalled and replaced, when required, by formal licences. The regulations and the terms of the licences are printed below. The interest taken is evidenced by the fact that 3,000 receiving station licences were issued in a period of approximately twelve months.

Up to the 1st July, 1924, three experimental stations, twenty-five Grade I and forty-four Grade II, have been licensed.

Amending regulations are now in course of preparation.

BROADCASTING STATIONS.

There are now seven broadcasting stations operating in New Zealand. Mutual interference is limited as far as practicable. The North and South Islands have been mapped out in suitable areas in which broadcasting stations of an appropriate power and using certain fixed wavelengths are to operate.

A scheme which is to be put into operation upon the enactment of suitable legislation is now under the consideration of the New Zealand Government whereunder radio-telephone broadcasting will be organised on a satisfactory financial basis and will be controlled by an organisation with a personnel representative of all interested parties.

WESTERN SAMOA.

The regulations governing the issue of licences for amateur, experimental and broadcasting stations are applicable in the mandated territory of Western Samoa, with the exception of Clauses 10 (a) and 22 (regarding British nationality). The powers conferred on the Minister of Telegraphs or the District Radio Inspector are, in the case of Western Samoa, to be read as references to the Administrator, the Secretary to the Administrator, or the Superintendent, Apia Radio Station, as the case may be.

COOK GROUP AND NIUE ISLAND.

Half-kilowatt spark radio-telegraph stations have recently been opened at Aitutaki and Mangaia in the Cook Islands Group to communicate with Radio-Rarotonga; and a radio-telephone station will be erected on Niue (or Savage) Island for communicating with Radio-Apia in Western Samoa.

EXTENDED WORKING BETWEEN SHORE AND SHIP STATIONS.

An agreement has been arrived at with the Administrations of the Commonwealth of Australia and Fiji, which permits intercommunication during certain hours between ship and shore stations *other than the nearest coast station* in waters bounded by the three countries.

RADIO DIRECTION-FINDING AND RADIO BEACONS.

The Marine Department in collaboration with the Post and Telegraph Department has continued its investigations into the utility of radio direction-finding apparatus in New Zealand waters. Tests of ship direction finding equipment operating in conjunction with temporary radio beacon stations at various points of the North Island have been carried out successfully.

ADMINISTRATION.

In July, 1914, regulations were made for the control of ships carrying wireless telegraph apparatus while within the territorial waters of New Zealand. These regulations were revoked and others made in lieu thereof by Order in Council dated January 30th, 1918. Further regulations for the control of amateur, experimental, and broadcasting stations were made by Order in Council dated January 17th, 1923. The regulations relating to ship stations were also amended by new regulations issued on September 14th, 1914, and further amended on January 17th, 1923.

The Laws and Regulations at present in force are printed below:—

- A —Extract from the Post and Telegraph Act, 1908 (Part X).
- B —Extracts from the Post and Telegraph Amendment Act, 1911 (amended 1913, 1920, and 1922).
- C —Extract from the Shipping and Seaman Amendment Act, 1909.
- D —Regulations as to certain ships being provided with wireless telegraph apparatus.
- E —Regulations affecting all ships within the territorial waters of New Zealand.
- F —Form of ship licence and regulations for the granting of licences to ships registered in New Zealand.

- G** —Agreement for Extended working between Shore and Ship Stations.
H —Provisional Permit for Experimental or Instructional Apparatus.
I —Radio Telegraph Regulations for Amateur, Experimental and Broadcasting Stations.
J —Amateur Receiving Licence.
K —Experimental Transmitting Licence.
L —Amateur Transmitting Licence (Grades I and II).
M —Broadcasting Licence.
N —Samoa Post and Telegraph Amendment Order, 1923.

POST AND TELEGRAPH ACT

A The following extracts from Part X of the Post and Telegraph Act, 1908, and from the Post and Telegraph Amendment Acts, 1911, 1913, 1920 and 1922, relate to wireless telegraphy in the Dominion:—

162. The Governor may from time to time establish stations for the purpose of receiving and transmitting telegraph messages within New Zealand or between New Zealand and parts beyond New Zealand by what is commonly known as "wireless telegraphy," including in that expression every method of transmitting messages by electricity otherwise than by wires, whether such method is in use at the time of the coming into operation of this Act, or is hereafter discovered or applied.

163. The provisions of Part VII of this division of this Act shall, as far as is applicable, *mutatis mutandis*, extend and apply to stations established under this part of this Act, and to communications by wireless telegraphy.

164. Every person who erects, constructs, or establishes any station or plant capable of transmitting or receiving wireless telegraphic signals otherwise than in accordance with a licence granted by him in that behalf by the Minister of Telegraphs is liable to a fine not exceeding five hundred pounds, and any plant, machinery, instruments, and material used by him for such purpose may be forfeited and dealt with as the Minister directs.

Part VII of this division of the Act referred to deals with the construction and regulation of electric lines. It authorises the Governor to establish electric lines and purchase lines and plant. He may make regulations as to the management, working and maintenance of any telegraph. Any officer or person employed in the working of any telegraph who improperly divulges the contents of any telegram transmitted or presented for transmission by such telegraph, or the purport of such telegram, is liable to a fine not exceeding one hundred pounds, or to imprisonment with hard labour for any period not exceeding six months.

EXTRACTS FROM AMENDMENT ACTS, OF 1911, 1913, 1920 AND 1922.

POST AND TELEGRAPH (AMENDMENT) ACTS 1911, SECTION 3, AS AMENDED BY SECTION 6 OF THE AMENDMENT ACT OF 1920.

B 3. (1) The Minister of Telegraphs may in accordance with regulations to be made in that behalf by the Governor-General in Council, grant licences to any person, association, or corporation for the installation and working within New Zealand or on board any ship registered in New Zealand,

of apparatus for wireless telegraphy, within the meaning of Part X of the principal Act.

(2) Subject to any such regulation, every such licence shall be in such form and for such period and shall contain such terms, conditions, and restrictions, as the Minister of Telegraphs thinks fit.

(3) The Governor may by Order in Council make such regulation as he thinks proper as to the granting of such licences, and as to the form, period, terms, conditions, and restrictions thereof and as to the fees payable in respect thereof.

POST AND TELEGRAPH (AMENDMENT) ACT 1913.

9. (1) The Governor may from time to time, by Order in Council, make such regulations as he thinks proper governing the use of wireless telegraph apparatus on merchant ships whether foreign ships or British ships not registered in New Zealand, while within the territorial waters of New Zealand.

(2) Such regulations may provide for the detention of any merchant ship on which a breach of the regulations has been made, pending the institution and determination of proceedings in respect of such breach and the recovery of any fine imposed in respect thereof.

POST AND TELEGRAPH (AMENDMENT) ACT, 1922.

9. The authority conferred on the Governor-General in Council by Sub-section 3 of Section 3 of the Post and Telegraph Amendment Act, 1911, to make regulations with respect to licences for the installation and working of apparatus for wireless telegraphy shall be deemed to include power to make regulations with respect to any or all of the matters following, namely:—

(a) The revocation or suspension of any such licence by the Minister of Telegraphs, and the grounds of such revocation or suspension;

(b) The dismantling or confiscation of any such apparatus by or by direction of the Minister, and the grounds on which the powers of dismantling or confiscation may be exercised;

(c) The making by licensees or applicants for licences of declarations of secrecy, designed to prevent the unauthorised divulgence of wireless communications that may be intercepted in the course of the exercise of the privileges conferred by the licence;

(d) The imposition of penalties for any breach of the regulations or of the conditions of a licence, or of any declaration of secrecy;

(e) The prohibition or regulation of the use of apparatus which may generate electric waves likely to interfere with the conduct of public wireless communications.

EXTRACT FROM THE SHIPPING AND SEAMEN AMENDMENT ACT, 1909.

50. The Governor may from time to time by Order in Council make regulations requiring ships registered in New Zealand and carrying passengers to be provided with apparatus for transmitting messages by means of wireless telegraphy, and may by such regulations prescribe fines not exceeding fifty pounds for any breach thereof by the owner or master of a ship.

REGULATIONS AS TO SHIPS REGISTERED IN NEW ZEALAND BEING PROVIDED WITH WIRELESS TELEGRAPHY APPARATUS.

D Order in Council, dated the 20th October, 1913, under the authority of Section 50 of the Shipping and Seamen Amendment Act, 1909, and amended by regulations made by Order in Council, dated 8th June, 1914.

REGULATIONS.

1. Every steamship registered in New Zealand, and carrying passengers, which is engaged in the foreign or inter-colonial trade, except steamships trading to the Chatham, Auckland, Campbell, and Antipodes Islands, and every home trade steamship which is authorised by her ordinary survey certificate to carry not less than 150 passengers at sea, shall not leave or attempt to leave any port in New Zealand unless such steamship is equipped with an efficient apparatus for radio communication in good working order, to be operated by a person skilled in the use of such apparatus, which apparatus shall be capable of transmitting and receiving messages over a distance of at least one hundred miles, day or night.

2. Ships required by these regulations to carry the apparatus prescribed above shall be placed in the third class as defined by Article XIII of the Detailed Service Regulations, appended to the International Radiotelegraph Convention, 1912—that is, they are not bound to perform any regular listening service.

3. The Minister of Marine may appoint inspectors for the purposes of these regulations, and such inspectors and superintendents of Mercantile Marine may visit any steamship required by these regulations to be equipped with apparatus for radio communication before they leave port, and ascertain if they are equipped with such apparatus the operation of which shall be carried on by a telegraphist holding a certificate as prescribed by Article X of the Detailed Service Regulations attached to the International Radiotelegraphic Convention.

4. Where a passenger steamship subject to these regulations is without the apparatus and the operator prescribed, and is about to attempt to leave port, an inspector or superintendent shall:—

(a) Notify the master of the fine to which he will be liable and of the particulars in respect of which the law has not been complied with;

(b) Notify at once the Collector of Customs, who may thereupon withhold the vessel's clearance until the requirements of these regulations are complied with;

(c) Prepare a report in writing of his action and transmit it to the Collector of Customs, who shall forward a copy to the Secretary of the Marine Department.

5. An inspector or superintendent may, at any time before a vessel subject to these regulations leaves port, require the master to

give him a certificate, in the form set forth in the appendix hereto, that the wireless apparatus of his ship is sufficient and in good working order, and the master shall give such certificate before the vessel leaves port.

6. The power necessary to transmit signals shall at all times, while the vessel is under way be available for the wireless operator's use.

7. Subject to the above regulations, the installation and operation of the apparatus required by them to be fitted shall be in conformity with the requirements of the Post and Telegraph Act, 1908, and its amendments, and the regulations made thereunder.

8. Any master or owner of a steamship committing a breach of these regulations is liable to a fine not exceeding £50.

APPENDIX.

This is to certify that the wireless operator in principal charge of the apparatus for radio-communication on the s.s. " " has this day certified to me in writing that the said apparatus is efficient and in good working order.

(Signed)

Master.

AMENDING REGULATIONS AS TO SHIPS BEING PROVIDED WITH WIRELESS TELEGRAPHY APPARATUS.

Made by Order in Council, dated the 8th day of June, 1914, under the authority of Section 50 of the Shipping and Seamen Amendment Act, 1909.

Provided further that, if in his opinion the circumstances justify it, the Minister of Marine may exempt steamships plying within any prescribed limits in the home trade from the operation of these regulations, and may, if he thinks fit, limit the time for which any such exemption shall be in force.

REGULATIONS

FOR CONTROL OF SHIPS CARRYING WIRELESS TELEGRAPH APPARATUS WHILE WITHIN TERRITORIAL WATERS OR HARBOURS OF NEW ZEALAND.

E Made by Order in Council on the 30th January, 1918, under the Authority of the Post and Telegraph Amendment Act, 1913, and Amended by Regulations made by Order in Council dated 17th January, 1923 for the Control of Ships carrying Wireless Telegraph Apparatus while within the Territorial Waters or Harbours of New Zealand.

1. In these regulations, if not inconsistent with the context:—

"Territorial waters of New Zealand" means and includes all tidal waters included within the Dominion of New Zealand, and all parts of the open sea within one marine league of the coasts of that Dominion measured from low-water mark.

"In harbour" means inside any harbour in New Zealand or within three miles of the entrance of any such harbour which a ship is about to enter or leave.

"Minister of Telegraphs" means the Minister of Telegraphs for the time being.

"Wireless telegraphy" has the same meaning as in Section 162 of the Post and Telegraph Act, 1908.

"Telegraph" has the same meaning as in section 119 of the Post and Telegraph Act 1908.

"Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His

Majesty's Navy or a naval station and any other wireless telegraph station, whether a coast station or a ship station.

"The Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

"Coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

"Ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

"Message" means a telegram or other communication made by means of wireless telegraphy.

2. These regulations shall apply only to foreign merchant ships and to British merchant ships not registered in New Zealand, while such British or foreign ships are within the territorial waters of New Zealand, or in harbour.

3. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

SHIPS IN TERRITORIAL WATERS.

4. All apparatus for wireless telegraphy on board a merchant ship while in the territorial waters of New Zealand shall be worked in such a way as not to interfere with naval signalling, or with the working of any wireless telegraph station lawfully established, installed, or worked, in the Dominion of New Zealand or the territorial waters thereof; and, in particular, the said apparatus shall be so worked as not to interrupt or interfere with the transmission of messages between wireless telegraph stations established on ships at sea and wireless telegraph coast stations.

5. If and whenever an emergency shall have arisen in which it is expedient in the public interest that His Majesty's Government shall have control over the transmission of messages by the said apparatus, and it shall be lawful for any officer of His Majesty's Navy or Army, or for any other person authorised in that behalf by the Admiralty, or by the Minister of Telegraphs, to take possession of or to cause the said apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty, and to be used for His Majesty's service, and, subject thereto, for such ordinary services as to the said officer or person may seem fit; and in that event any person authorised by the said officer or person may enter upon any ship on which such apparatus is installed and take possession of the said apparatus and use the same as aforesaid.

6. Any such officer or person may in such event as aforesaid, instead of taking possession of the said apparatus as aforesaid, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the said apparatus, either wholly or partly, and in such manner as he may direct and such persons may enter upon any ship on which the said apparatus is installed accordingly; or the said officer or person may direct the person or persons in charge of the said apparatus to submit to him, or any person authorised by him, all messages tendered for transmission or arriving by the said apparatus or any class or classes of such messages, to stop or delay the transmission of any messages, or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the

said officer or person may prescribe, and the said person or persons in charge of the said apparatus shall obey and conform to all such directions.

SHIPS IN HARBOUR.

7. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in harbour, except as hereinafter provided or with the consent in writing of the Minister of Telegraphs.

(a) When the ship is in any harbour of the Dominion of New Zealand, but not berthed—*i.e.*, out of touch with the land line telegraph system—the licensed apparatus may be used for the purpose of communicating, on minimum power, with the nearest coast station, or may be used in circumstances in which communication with the nearest coast station is impracticable, and where the interest of navigation would be facilitated thereby, to establish communication with a more distant coast station, or, if necessary, with another ship station.

(b) In exceptional circumstances, such as the non-operation from any cause of the land line telegraph system, when the ship is in any harbour of the Dominion of New Zealand and berthed therein, the licensed apparatus may be used to communicate with the nearest coast station on matters affecting the interest of navigation. When it is impracticable to communicate with the nearest coast station, communication may be established with a more distant coast station, or, if necessary, with another ship station.

(Regulations 8, 9, 10, 11 and 12 revoked.)

PENALTIES.

13. If any breach of these regulations is committed by any person on board any ship while in the territorial waters of New Zealand or in harbour, the person so committing the same and the owner and master of the ship shall be severally liable on summary conviction to a fine not exceeding £100.

14. Whenever the Minister of Telegraphs or the Secretary of the Post and Telegraph Department has reasonable cause to believe or suspect that any breach of these regulations has been committed on board any ship while in the territorial waters of New Zealand, or in harbour, he may give notice in writing to the Collector of Customs at any port in New Zealand to detain the ship under section 9 of the Post and Telegraph Amendment Act, 1913, until the sum of £100, or such smaller sum as may be specified in the notice, has been deposited with the Collector by or on behalf of the owner of the ship.

15. If on the receipt of that notice, or at any time within three months thereafter, the ship is found within such port, the Collector of Customs shall withhold the certificate of clearance of the ship under section 35 of the Customs Act, 1913, until and unless the aforesaid sum is deposited with him or the aforesaid notice of detention is withdrawn.

16. If within six months after the date of the offence in respect of which the ship has been detained a conviction for that offence is obtained against any person, the sum so deposited shall be available for the satisfaction of any fine and costs imposed or awarded by the conviction, and the residue, if any, shall be returned to the person by whom or on whose behalf the deposit was made.

17. If within the period of six months aforesaid no such conviction is obtained, the sum so deposited shall be returned to the person by whom or on whose behalf it was deposited.

In pursuance and exercise of the power and authority conferred upon me by section 3 of the Post and Telegraph Amendment Act, 1911, and section 6 of the Post and Telegraph Amendment Act, 1920, I, Minister of Telegraphs of the Dominion of New Zealand, hereby grant a licence to _____ for the installation and working of apparatus for wireless telegraphy (within the meaning of Part X of

.....
Secretary, Post and Telegraph Department.

Name of Ship on which Station established.	Class of Ship Station under the Radiotelegraph Convention, 1912.	Call Signal.	Nature of Services performed.	Hours of Service.	Normal Range of Signalling in Nautical Miles.		Character of Apparatus.		Power.		
(1)	(2)	(3)	(4)	(5)	By Night.	By Day.	System of Radio-telegraphy, with the Characteristics of the System of Emission.	Wavelengths (in Metres).	Source & Maximum Output.	Maximum to be normally taken by Sending instruments.	If Alternator is used, Number of Cycles per Second.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

2. The Minister of Telegraphs may, at the request of any person or company desirous of establishing, installing, working, and using

on ships belonging to such person or company, and registered in New Zealand, apparatus for wireless telegraphy, grant to such person or company (hereinafter called "the licensee") a licence, in the form of the Schedule hereto, for the period, upon the terms, and subject to the conditions and restrictions hereinafter appearing.

3. Each ship station is bound to exchange radiotelegrams with any coast station, or with any other ship station, without distinction as to the radiotelegraph system adopted by that station.

4. Each ship station shall be of such class mentioned in Article 13 of the Service Regulations annexed to the Radiotelegraph Convention, 1912, as is specified in the licence issued in respect thereof, and the equipment of the station, hours of duty observed, and other requirements shall be appropriate to such class in accordance with the provisions of the Radiotelegraph Convention, 1912.

5. The apparatus used at all ship stations shall, as far as possible, be in keeping with scientific and technical progress. The waves emitted must be as pure and as little damped as possible.

6. The apparatus must be capable of transmitting and receiving at a speed of at least equal to twenty words per minute, the word being reckoned at the rate of five letters.

7. The apparatus shall be so constructed as to be capable of using wavelengths of 600 to 300 metres as measured by the standard of measurement in use by the Post and Telegraph Department for the time being; and such other wavelengths not exceeding 600 metres as shall be authorised from time to time by the Minister of Telegraphs; Provided always that the wavelength of 600 metres shall normally be used for communication, and, further, that the wavelength of 1,500 metres may be used for transmission in the exceptional case referred to by Article 35 (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention, 1912; Provided, further, that only wavelengths of 600 metres shall be used by the licensee during the period of any war in which the United Kingdom is engaged.

8. (1) The licensed apparatus shall not be used by the licensee, or by any other person either on behalf or by permission of the licensee, for the transmission or receipt of messages except messages authorised by these regulations; and the licensee shall not, except as hereinafter provided or with the consent in writing of the Minister of Telegraphs, send or receive messages from or at the licensed apparatus when in any harbour in the Dominion of New Zealand.

(2) When the ship is in any harbour of the Dominion of New Zealand, but not berthed—*i.e.*, out of touch with the land-line telegraph system—the licensed apparatus may be used for the purpose of communication, on minimum power, with the nearest coast station, or may be used in circumstances in which communication with the nearest coast station is impracticable, and where the interests of navigation would be facilitated thereby, to establish communication with a more distant coast station, or, if necessary, with another ship station.

(3) In exceptional circumstances, such as the non-operation from any cause of the land line telegraph system, when the ship is in any harbour of the Dominion of New Zealand and berthed therein, the licensed apparatus may be used to communicate with the nearest coast station on

matters affecting the interests of navigation. When it is impracticable to communicate with the nearest coast station, communication may be established with a more distant coast station, or, if necessary, with another ship station.

9. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus, interfere with naval signalling.

(2) If the Admiralty are of opinion that the working of the licensed apparatus at any ship station is inconsistent with the free use of naval signalling, the licensee shall, when required in writing by the Minister of Telegraphs so to do, close the said station.

(3) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of the licence.

10. The licensee shall observe the International Telegraph Convention and International Telegraph Regulations so far as the said convention and regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

11. The licensee shall observe the provisions of any regulations from time to time made under the provisions of the Post and Telegraph Act, 1908, and its amendments, by the Governor-General, in Council or by the Minister of Telegraphs in relation to the conduct of wireless telegraph business, so far as the same are applicable to the licensee.

12. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912.

13. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister of Telegraphs from time to time for the purpose of preventing interference with the working of any other wireless telegraph station, and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

14. The licensed apparatus shall not, without the consent of the Minister of Telegraphs be altered or modified in respect of any of the particulars referred to in the licence issued in respect thereof, and such apparatus shall at all times be maintained in good working order.

15. Except as provided in these regulations, the licensee shall transmit messages by means of the licensed apparatus on equal terms, without favour or preference, whether as regards rates of charge, order of transmission, or otherwise.

16. The licensee shall, so far as possible, receive from ships and light stations all requests for assistance and all signals of distress, and shall answer such requests and signals and retransmit them with the least possible delay, and with priority over all other messages, to the proper authorities by means of the licensed apparatus or by any other means in the power of the licensee.

17. The licensed apparatus at ship stations shall be worked only by a person or persons holding a certificate or certificates issued or recognised by the Minister of Telegraphs. Certificates shall be granted to persons of British nationality possessing the qualifications prescribed by the Radiotelegraph Convention, 1912, and shall be in such form and subject to such conditions, directions, or rules as the Minister of Telegraphs shall from time to time prescribe; and such certificate may at any

time be withdrawn at the discretion of the Minister of Telegraphs in case of misconduct, or breach, on the part of the holder, of the Radiotelegraph Convention, 1912, or of any conditions, directions, or rules prescribed by the Minister of Telegraphs for the guidance of operators or for the working of such ship stations.

18. (1) The licensee, his servants and agents, shall not divulge the contents or the purport of the contents of any message, or make any use whatever of any message coming to his or their knowledge, other than to the addressee or his authorised agent, or to properly authorised officials of His Majesty's Government or of the Minister of Telegraphs, or to a competent legal tribunal.

(2) The licensee shall render to the Minister of Telegraphs such accounts as the Minister of Telegraphs shall direct in respect of all charges due or payable under the Radiotelegraph Convention, 1912, in respect of messages exchanged between the licensed ship stations and coast stations and shall pay to the Minister of Telegraphs, at such times and in such manner as the Minister of Telegraphs shall direct, all sums which shall be due from the licensee under such accounts.

19. The licensee shall keep full accounts records, and registers of all messages transmitted by means of the licensed apparatus; and in such registers each of such messages shall be accompanied by its identifying number and date, and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister of Telegraphs shall from time to time reasonably require to be shown. The licensee shall preserve all used message forms written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraph Convention, 1912, and, in default of any provisions on the subject in the said convention, for such period as is from time to time prescribed by the International Telegraph Regulations; and such registers and message papers shall be open to the inspection of the Minister of Telegraphs or his authorised officers.

20. The Minister of Telegraphs, and any agent authorised in that behalf in writing by him, may at all reasonable times enter upon any licensed ship station for the purpose of inspecting, and may inspect any apparatus fixed or being in such station for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such station, and the working and user of such apparatus and telegraphic instruments.

21. The licensee shall carry on every ship on which a ship station is established a print or copy of the licence, certified under the hand of an appropriate officer of the Minister of Telegraphs to be a true copy, and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls, and also such documents as may be prescribed by the Minister of Telegraphs for the purpose of enabling the licensee to communicate with coast stations and ship stations, in accordance with the Radiotelegraph Convention, 1912.

22. (1) Every licence shall be in force from the date of the granting thereof until the 31st December of the year in which it is issued, and no longer; but may be renewed from year to year.

(2) The licensee shall pay to the Minister of Telegraphs for and in respect of the licence

granted, and of every renewal thereof, a royalty of 5s. in respect of each ship station included in the licence.

(3) All royalties payable under any licence shall be payable on the date of the granting or renewal thereof, as the case may be.

23. Except with the consent in writing of the Minister of Telegraphs, the licensee shall not assign, underlet, or otherwise dispose of or admit any other persons or body to participate in the benefit of any licence.

24. If and whenever an emergency shall have arisen in which it is expedient in the public interest that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus, it shall be lawful for any officer of His Majesty's Navy or Army, or for any other person authorised in that behalf by the Admiralty, or by the Minister of Telegraphs, to take possession of or to cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty, and to be used for His Majesty's service and subject thereto for such ordinary services as to the said officer or person may seem fit; and in that event any person authorised by the said officer or person may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid.

25. Any such officer or person may in such event as aforesaid, instead of taking possession of the licensed apparatus as aforesaid, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct, and such persons may enter upon any ship on which any apparatus is installed accordingly; or the said officer or person may direct the licensee, his servants or agents, to submit to him, or any person authorised by him, all messages tendered for transmission or arriving by the licensed apparatus, or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said officer or person may prescribe, and the licensee, his servants or agents, shall obey and conform to all such directions.

26. In any of the following cases, that is to say:—

(a) In case any sum of money which ought to be paid by the licensee to the Minister of Telegraphs under or by virtue of these regulations shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case any breach, non-observance, of or non-performance by or on the part of the licensee, his servants or agents, of any of the provisions (other than a provision for the payment of money) or conditions herein contained,—

then and in any such case the Minister of Telegraphs may, by notice in writing, revoke and determine the licence as to all or any of the ship stations thereby licensed, and thereupon the said licence shall absolutely cease, determine, and become void as to all or any of the said ship stations, as the case may be, but without prejudice to any right of action or remedy which shall have accrued to His Majesty under these regulations or otherwise.

27. Nothing in these regulations shall prejudice or affect the right of the Minister of Telegraphs from time to time to establish,

extend, maintain, and work any system or systems of telegraphic communication (whether of a like nature to those licensed hereunder or otherwise) in such manner as he shall in his discretion think fit. Neither shall anything herein contained prejudice or affect the right of the Minister of Telegraphs from time to time to enter into agreements for or to grant licences relative to the working and use of telegraphs (whether of a like nature to those licensed hereunder or otherwise) or the transmission of messages in any part of New Zealand by means of wireless telegraphy, or by any other means, with or to any person or persons whomsoever, upon such terms as he shall in his discretion think fit. And (save as in these regulations expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Minister of Telegraphs by or under the Post and Telegraph Act, 1908.

28. Any notice, request, or consent (whether required to be in writing or not) to be given by the Minister of Telegraphs under these regulations may be under the hand of the Secretary for the time being of the Post and Telegraph Department, and may be served by sending the same in a registered letter addressed to the licensee at the office or place of residence for the time being of the licensee, or, if such notice, request, or consent relates to any particular ship station, by delivery to the master of the ship upon which such station is installed; and any notice to be given by the licensee under these regulations may be served by sending the same in a registered letter addressed to the Secretary, General Post Office, Wellington.

29. All licences heretofore issued under the regulations hereby revoked shall continue in force, subject to the regulations under which they were issued, until the expiry of the current term thereof, but shall not be capable of renewal under the regulations so revoked.

AGREEMENT FOR EXTENDED WORKING BETWEEN SHORE AND SHIP STATIONS.

An agreement has been arrived at with the Administrations of the Commonwealth of Australia and Fiji, which permits intercommunication during certain hours between ship and shore stations other than the nearest coast station in waters bounded by the three countries.

The procedure to be observed for extended range working is as follows:—

1. Provided a ship station is not within 25 miles of the nearest coast station it may work a more distant coast station at any time provided the ship station transmits on a wavelength of 450 metres. The call shall be made on a wavelength of 600 metres and the coast station shall acknowledge the traffic on a wavelength of 600 metres.

2. Ship stations may relay traffic for a coast station other than the nearest, at any time provided such transmission is made on a wavelength of 450 metres by the originating ship station as well as the relaying station. All calls shall, however, be made on a wavelength of 600 metres.

3. While working on a wavelength of 450 metres, coast and ship stations must suspend work at the end of each period of fifteen minutes, and keep watch on the wavelength of 600 metres during a period of three minutes before continuing transmission or reception on a wavelength of 50 metres, as provided in Article 32 of the Convention Regulations.

4. Coast station may transmit traffic to ship stations that are not within 25 miles of a

coast station belonging to another Administration, at any time on a wavelength of 600 metres, provided the ship station can receive the traffic without difficulty, and no interference with the nearest coast station results.

5. The exchange of traffic between ship stations and the nearest coast station must be given priority over traffic for transmission between ship stations and a more distant coast station, whether such traffic is transmitted on a wavelength of 450 metres by the ship station or on 600 metres by the coast station.

6. A ship station shall, when required at the request of the nearest coast station, cease working on a wavelength of 450 metres.

7. Immediately a ship station is equipped for transmission on a wavelength of 450 metres, it will be an infringement of these rules for that station to transmit traffic for any coast station other than the nearest coast station except on a wavelength of 450 metres.

WIRELESS TELEGRAPH TRAFFIC.

The following rules indicate the New Zealand Coast Radio Station which should, under normal circumstances, be worked by Intercolonial, Trans-Pacific, Oversea, and Coastal vessels when such vessels are within wireless range of the New Zealand coast.

INTERCOLONIAL.

1. (a) Vessels sailing in either direction between any South Island (N.Z.) port, and any Commonwealth port, *via* FOVEAUX STRAIT, will be worked by Radio-Awarua.

(b) Should Radio-Awarua be closed for traffic from ships (as at present) vessels indicated in (1) (2) will be worked by Radio-Wellington. (See footnote "Vessels bound *via* FOVEAUX STRAIT; working in daylight.")

2. Vessels sailing in either direction between any South Island (N.Z.) port and any Commonwealth port, *via* Cook Strait will be worked by Radio-Wellington.

3. Vessels sailing in either direction between Wanganui or Wellington, and any Commonwealth port, will be worked by Radio-Wellington.

4. Vessels sailing in either direction between Napier, Gisborne, or other East Coast port South of East Cape, and any Commonwealth port *via* Cook Strait, will be worked by Radio-Wellington.

5. (a) Vessels sailing in either direction between any East Coast port North of East Cape and any Commonwealth port will be worked by Radio-Auckland.

(See footnote).

NOTE.—*re* Vessels sailing in either direction between (a) any Commonwealth port or any West Coast (N.Z.) ports, and (b) any other N.Z. port *via* Foveaux Strait: working in daylight.

It should be noted that daylight communication between such vessels and RADIO-WELLINGTON is as a general rule impracticable. This is particularly applicable to vessels when nearing the West Coast or rounding the South Island through Foveaux Strait. Operators on vessels sailing in these directions should endeavour to clear traffic during the night hours when no difficulty should be experienced. Awarua Radio keeps watch for Distress Calls between the hours of 6 a.m. and 8 p.m.; and will notify Radio-Wellington regarding any vessels calling with traffic during that time, but the traffic should be held until the hours of darkness unless of an urgent nature. Awarua is fitted with a Spark Coil, with which short range communication with vessels is practicable, and is actually carried out when the traffic relates to local navigation.

(b) Vessels sailing in either direction *via* NORTH CAPE between any East Coast port South of East Cape and any Commonwealth port, will be worked by Radio-Auckland whilst the vessel is north of East Cape, and by Radio-Wellington when the vessel is south of East Cape.

6. Vessels sailing in either direction between New Plymouth, or other West Coast port north of New Plymouth and any Commonwealth port, will be worked by Radio-Auckland.

(See footnote).

TRANS-PACIFIC.

7. (a) Vessels sailing in either direction between (a) Suva, Nauru, or any of the Pacific Islands to the Westward of Rarotonga, and (b) Auckland, New Plymouth, or any New Zealand port north of the East Cape on the East Coast or north of New Plymouth on the West Coast will be worked by Radio-Auckland. (See footnote).

(b) In the event of any vessel mentioned in preceding paragraph (a) being bound direct to (or from) any New Zealand port south of East Cape, or south of New Plymouth, such vessel will be worked by Radio-Wellington when the vessel is south of East Cape or south of New Plymouth as the case may be.

8. Vessels sailing in either direction between (a) Makatea Island, Rarotonga, or San Francisco *via* Rarotonga, and (b) Auckland, New Plymouth, or any East Coast port north of East Cape, or West Coast port north of New Plymouth, will be worked by Radio-Auckland. (See footnote).

9. Vessels sailing in either direction between (a) Rarotonga, San Francisco, *via* Rarotonga, or Makatea Island, and (b) Wellington or any New Zealand port on the East Coast south of the East Cape or any New Zealand port on the West Coast south of New Plymouth (*via* Cook Strait) will be worked by Radio-Wellington. (This includes the San Francisco-Wellington Mail steamers).

OVERSEA VESSELS.

10. Vessels sailing in either direction between Panama Canal or Monte Video and Auckland, or any East Coast port north of the East Cape, or any West Coast port north of New Plymouth, will work Radio-Auckland. (See footnote).

11. Vessels sailing in either direction between Panama Canal or Monte Video and Wellington, New Plymouth, or any New Zealand port south of East Cape on East Coast or south of New Plymouth on West Coast, will work Radio-Wellington.

COASTAL.

12. Vessels sailing between one New Zealand port and another.—When open for traffic Awarua will work vessels which are south of Lyttelton on the East Coast or south of Greymouth on the West Coast. When Awarua is not open for traffic (as at present) Radio-Wellington will work these vessels.

13. Vessels on the West Coast whilst south of New Plymouth and north of Greymouth and

Footnote to 5, 6, 7, 8 and 10.

Awanui keeps only a restricted watch on 600 metres for ship stations. Radio-Auckland's watch on that wavelength is continuous. Vessels should call Radio-Auckland, and work that station as much as possible. Radios Awanui and Auckland are connected by Morse line, and Awanui will stand by on 600 metres to assist Auckland at all times when he is not working on 2,000 metres.

vessels on the East Coast whilst south of the East Cape and north of Lyttelton will work Radio-Wellington.

14. Vessels on the West Coast whilst north of New Plymouth and vessels on the East Coast whilst north of the East Cape will work Radio-Auckland.

15. It should be noted that during daylight hours, Radio-Wellington and Radio-Awarua are badly screened from ship stations in the vicinity of Westport and vessels in that locality should endeavour to work Auckland or Awanui if difficulty is experienced in working Wellington during those hours.

16. Similarly the locality round about Tolaga Bay and Tokomaru Bay is rather badly screened from Auckland and Wellington during the daylight hours and ship stations may find it necessary to relay urgent traffic during those hours if other vessels are in such a position as to be able to render assistance.

POST AND TELEGRAPH DEPARTMENT

PROVISIONAL PERMIT ISSUED BY THE MINISTRY OF TELEGRAPHS.

AUTHORISING THE USE OF WIRELESS

RECEIVING APPARATUS FOR EXPERIMENTAL OR INSTRUCTIONAL PURPOSES AS INDICATED HEREON.

PARTICULARS REGARDING PERMITTEE AND APPARATUS.

Name of person to whom the permit is issued, and where applicable, the body on whose behalf the permit is held:—

Address:

Location of apparatus:—

Purpose for which apparatus authorised (experimental or instructional):

THIS PERMIT authorises the person or body referred to herein to use for experimental/instructional purposes wireless receiving apparatus subject to the conditions hereinafter mentioned. The Permit is a provisional one and will subsequently be replaced, where circumstances justify the same, by a licence.

The Permit is subject to withdrawal or cancellation at any time when, in the opinion of the Minister of Telegraphs, such action becomes necessary.

Any breach of the conditions referred to will result in withdrawal or cancellation of the Permit and will be regarded *per se* as indicating the unfitness of the Permittee to receive a regular licence.

While it is the intention to give every reasonable facility to persons or bodies who are in any way likely to further the interests of wireless science or of radio communication, and who are not actuated solely by motives of amusement, it should be distinctly understood that the Minister of Telegraphs is charged *inter alia* with the responsibility for the uninterrupted carrying-on of the public radio services, for the secrecy of public radio correspondence, and for the reliable detection of Distress Signals upon which depends in a great measure the safety of life at sea. These facts render it imperative that the following conditions should be strictly observed, and Permittees are therefore enjoined to co-operate with the Post and Telegraph Department in every possible way with a view to ensuring the furtherance of the objects mentioned.

Secretary, Post and Telegraph Department.
Date

Signature of Permittee.

Witness:

Radio Inspector.

Date:

CONDITIONS, UNDER WHICH PERMIT IS ISSUED.

1. "Radio Inspector" in this Permit means the District Telegraph Engineer of the district in which the wireless receiving station is situated, or such officer or officers as may be deputed by him. "Permittee" means the person in whose name the Permit is issued, and who is held responsible for the due observance of the following conditions:—

2. *Object of Permit.*—This Permit authorises the use of the wireless receiving apparatus described in Schedule A, or such modification thereof as may subsequently be approved in writing by the Radio Inspector.

3. *Alterations to Apparatus.*—Any change that is contemplated in the type or characteristics of the receiving apparatus referred to in Schedule A must first be notified in writing to the Radio Inspector and be accompanied where necessary by descriptive diagrams. These changes must not be effected until the written sanction of the Radio Inspector has been obtained. This precaution is necessitated mainly on account of the highly "interfering" properties of valve receivers operating under certain conditions, and it should be clearly understood by Permittees authorised to use valve receivers that serious interference may actually result from the same within a radius of ten miles of a public radio station.

4. *Amateur Warning Signal.*—When using valve receivers within ten miles of a Government Radio Coast Station, Permittees must continually listen for the Amateur Warning Signal from such station—*viz.*, A.A.A.A.Q.R.M. (followed by a figure indicating minutes), and must immediately cease operations upon receipt of the same until the time indicated has expired. In this connection the greatest care must be exercised on the part of the Permittee to avoid interfering with the receipt and handling by radio stations open for public correspondence of the International Distress Signal, SOS.

5. *SOS Signals: Proc dure.*—If, in connection with his use of the authorised apparatus any Distress Signals should come under the notice of the Permittee, and there is reason to believe that such signals have not been intercepted by a radio station open to public correspondence, the Permittee shall immediately take such steps as may be available (*e.g.*, by telephone) for communicating the same to the nearest Government radio station, or, if this be impracticable, to a responsible officer of the Post and Telegraph Department.

6. *Custody of Apparatus.*—The wireless apparatus authorised by this Permit shall be kept in secure custody, and no part of the same shall be removed from its authorised location without the approval of the Radio Inspector.

7. *Inspection of Apparatus.*—The wireless apparatus shall be subject to inspection by the Radio Inspector at all times, and every facility shall be given to such officer to carry out any inspection or test that may be considered necessary.

8. *Supervision by Permittee.*—The apparatus shall not be brought into operation for any purpose in the absence of the Permittee or apart from his supervision, and in order to safeguard this requirement the Permittee must see that Condition 6, requiring the apparatus to be kept in safe custody, is faithfully observed.

9. *Declaration of Secrecy.*—The Permittee shall be required to execute a Declaration of Secrecy which provides that he shall not divulge to any unauthorised person any information relating to public radio correspondence

which may come to his knowledge, and that he will by every means in his power seek to preserve the secrecy of the same. Exception is made in the case of meteorological and time signals which are broadcasted for general information. Any breach of this condition will be seriously noticed. The Permittee shall not commit to writing any such public radio correspondence that may come to his knowledge, and shall be responsible for seeing that no unauthorised person is permitted to become acquainted with the same. In the case of bodies for whom the Permittee may be acting in a representative capacity, the latter shall be held responsible for satisfying the Radio Inspector that all members of the body having access to the apparatus shall first have executed the Declaration of Secrecy. The apparatus shall be regarded as under the direct supervision of the Permittee, but, in order to facilitate the work of such body, the responsibility of supervision may be shared with one or more approved persons, as may be arranged in writing with the Radio Inspector. These responsible supervisors shall be present whenever the apparatus is being used, and shall supervise such use with the object of ensuring that all the conditions of the Permit, particularly those relating to the Amateur Warning Signal, to Distress Signals, and to the secrecy of public correspondence, are strictly observed.

10. *Log Record.*—The Permittee shall keep a log record showing the hours during which the authorised apparatus is in operation and embodying a record of the reception of any of the special signals referred to in Condition 4. This log shall be produced for perusal by the Radio Inspector whenever required.

11. *Temporary Disuse of Apparatus.*—Apart from the requirements of Condition 4, the use of the apparatus shall cease at any time and for any period that may be considered necessary by the Radio Inspector.

12. *Amendment of Conditions.*—The Permittee shall be prepared and shall be required to comply with any amended or additional conditions that circumstances may from time to time render it necessary to impose.

SCHEDULE A.

DESCRIPTION OF WIRELESS RECEIVING APPARATUS AUTHORISED UNDER THIS PERMIT.

RADIOTELEGRAPH REGULATIONS FOR AMATEUR, EXPERIMENTAL AND BROADCASTING STATIONS.

JELlicoe, Governor-General.

ORDER IN COUNCIL.

At the Government Buildings at Wellington, the 17th day of January, 1923.

Present:

The RIGHT HONOURABLE W. F. MASSEY, P.C., PRESIDING IN COUNCIL.

I In pursuance and exercise of the power and authority conferred on him by the Post and Telegraph Act, 1908, and its amendments, His Excellency the Governor-General of the Dominion of New Zealand, acting by and with the advice and consent of the Executive Council of the said Dominion, doth hereby make the following regulations in connection with the licensing of the installation and working of apparatus for radiotelegraphy; and doth direct that this Order in Council shall have effect from the date of its publication in the "New Zealand Gazette."

REGULATIONS.

INTERPRETATION.

1. In these regulations, if not inconsistent with the context:—

“The Admiralty” means the Commissioners for executing the office of Lord High Admiralty of the United Kingdom of Great Britain and Ireland;

“Amateur station” means a radio station licensed for the reception, or for the reception and transmission of radio communications other than public correspondence, and erected solely for personal interest or for experimental purposes;

“Antenna” means the electrical conductor or system of conductors used for receiving or emitting electro-magnetic waves;

“Apparatus” means and includes all equipment of every kind used in radio telegraphy;

“Broadcasting station” means a radio station licensed to broadcast for general information certain classes of radio communications specified in the licence;

“Coast station” means a radio station which is established on land or on board a ship permanently moored, and which is open for the service of public correspondence;

“Continuous waves” means waves which, after reaching the steady state, are periodic, *i.e.*, the successive oscillations are identical;

“Damped waves” means waves consisting of successive wave trains in which the amplitude of the oscillations, after reaching a maximum, declines gradually;

“District Radio Inspector” means the District Telegraph Engineer of the District in which the radio station is situated;

“Deputy Radio Inspector” or “Assistant Radio Inspector” means such officer or officers of the Post and Telegraph Department as may, with the general approval of the Minister, be deputed from time to time by the District Radio Inspector to act on his behalf;

“Experimental station” means a radio station licensed for the reception, or for the reception and transmission of radio communications intended to promote investigations of a scientific character;

“Government station” means any radio station at which radio communications are transmitted or received by means of radio telegraphy, and which is operated by any Government Department or by the Admiralty;

“Licensee” means any person, association, or corporation to whom a licence for a radio station is granted in pursuance of these regulations;

“Minister” means the Minister of Telegraphs for the time being;

“Naval signalling” means signalling by means of radiotelegraphy between two or more ships of His Majesty’s Navy, between ships of His Majesty’s Navy, between ships of His Majesty’s Navy and Naval stations, or between a ship of His Majesty’s Navy or a Naval station and any other radio station;

“Operator” means any person to whom an amateur operator’s certificate is issued in pursuance of these regulations;

“Public correspondence” means any radio communication transmitted by or intended for a Government station or any licensed radio station other than an amateur, experimental, or broadcasting station, except such radio communications as may be broadcasted for general information;

“Radio communication” means any communication, message, or signal propagated by means of radio telegraphy;

“Radio Inspector” means such officer or officers of the Post and Telegraph Department as shall from time to time be appointed by the Minister to act in that capacity;

“Radio station” means any station where radio communications are transmitted or received by means of radio telegraphy;

“The Radio Telegraph Convention, 1912” means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made therein; and includes any modification of the Convention or regulations made from time to time;

“Radio telegraphy” means every system of electrical communication utilizing radio frequencies with or without the use of conductors to connect the signalling points, and includes therein all systems of radiotelephony;

“Ship station” means a licensed station established on board a ship which is not permanently moored.

GENERAL.

2. The Minister may, at the request of any person, association or corporation, desirous of establishing, installing, working, or using apparatus for radiotelegraphy for amateur, experimental, or broadcasting purposes, grant to such person, association or corporation, a licence in the form of the Schedule hereto for the period, upon the terms, and subject to these regulations, and to such conditions and restrictions, not inconsistent with such regulations, as the Minister may impose from time to time.

3. Subject to these regulations, no person shall operate a radio station for which any such licence is granted unless he is the holder of an amateur operator’s certificate which may be issued in pursuance of these regulations.

4. Any of the powers or authorities given to the Minister by these regulations may be delegated by him to such officer or officers of the Post and Telegraph Department as he thinks fit.

5. A Radio Inspector may exercise any of the powers conferred by these regulations on a District Radio Inspector; and a Deputy Radio Inspector or an Assistant Radio Inspector may exercise such of the powers of a District Radio Inspector as that officer may, with the general approval of the Minister, delegate to him.

RADIO DISTRICTS AND RADIO INSPECTORS.

6. For the purposes of these regulations the mainland of New Zealand shall be divided into four (4) radio districts, which shall be identical with the telegraph and telephone districts superintended by District Telegraph Engineers. These radio districts shall be classified as follows:—

- | | |
|-----------------|-----------------|
| (1) Auckland | (3) Canterbury. |
| (2) Wellington. | (4) Otago. |

Chatham Islands shall be included in the Wellington Radio District, and Stewart Island shall be included in the Otago Radio District.

District Radio Inspectors of the above-mentioned radio districts shall be respectively the District Telegraph Engineers, Auckland, Wellington, Christchurch, Dunedin.

7. The following shall each constitute a separate radio district classified as under:—

- | | |
|--------------------|-------------------|
| (5) Western Samoa. | (6) Cook Islands. |
|--------------------|-------------------|

The radio Inspectors of these districts shall be respectively the Superintendents of the coast stations Radio-Apia and Radio-Rarotonga, and such other officer or officers as may be appointed by the Minister.

8. Intending applicants should make inquiries to the nearest District or Deputy Radio Inspector where doubt exists as to the radio district in which the proposed radio station is located.

APPLICATIONS.

9. Intending applicants for a licence to erect or operate an amateur, experimental, or broadcasting station should, in the first instance, apply to the nearest District or Deputy Radio Inspector, who will furnish any needed advice and supply forms of application.

10. Every applicant for any such licence or for an operator's certificate shall furnish to the satisfaction of the Minister such technical or other information as may be required by him; and, in addition thereto:—

- (a) Evidence of British nationality;
- (b) A reference as to character from a reputable citizen not related to the applicant;
- (c) Date and place of birth;
- (d) Full name and address;
- (e) Information as to whether the licence is required on his own behalf or on behalf of an association or corporation; and
- (f) A statement as to the purpose of the proposed radio station.

11. The required information having been inserted on the proper form, the application shall be signed by the applicant and verified by a statutory declaration made by him.

12. The application shall then be forwarded to the nearest District Radio Inspector who shall satisfy himself as to the qualifications of the applicants and will then despatch the applicant to headquarters for consideration.

Should the application be approved, the applicant will be notified that he may proceed to erect a station. Upon the completion of the erection notification to that effect shall be sent to the District Radio Inspector. Where deemed necessary the District Radio Inspector shall inspect the station to determine whether it fulfils the requirements of the regulations. If, in his opinion, the station complies with the regulations and is satisfactory in all respects, the District Radio Inspector shall issue a licence accordingly. The licensee may then, and not until then, operate the station or permit the station to be operated strictly in accordance with these regulations.

13. Where it is impracticable for the District Radio Inspector to have the completed radio station inspected within a reasonable time and where he has reason to believe that the regulations have been complied with, he may issue a temporary permit for the operation of the station in accordance with these regulations until it is duly inspected and approved.

LICENCES AND OPERATOR'S CERTIFICATES.

14. The licence shall specify all the information necessary to the identification of the licensee and of the licensed radio station, and, in addition, shall include technical particulars of the radio station and of the power, wavelength and types of transmission authorised therein.

15. The licence for a radio station shall remain in operation for a period of twelve months from the date of issue.

16. An application for renewal of a licence for a radio station shall be made through the District Radio Inspector on the form provided for the purpose, and shall be accompanied by the amount of the annual fee for the ensuing period.

17. An amateur operator's certificate is not transferable; and the licence for a radio station shall not be transferred except upon the approval of the Minister.

18. In the event of the loss, mutilation or destruction from any cause of an amateur operator's certificate or of a licence for a radio station, application for a duplicate should be made to the District Radio Inspector, and the

applicant shall forward a statutory declaration setting out the circumstances connected with the loss, mutilation or destruction of the certificate or licence.

The application shall be investigated by the District Radio Inspector who will forward the same to headquarters for consideration. If it be decided to issue a duplicate, the certificate or licence shall be endorsed "duplicate" across the face. A fee of 5s. shall be payable for the duplicate certificate or licence.

19. The holder of an amateur apparatus certificate shall be required, during the holding of the said certificate, to maintain his proficiency in the subjects covered by the certificate and where a District Radio Inspector has reason to believe that this regulation is not being complied with, and the non-compliance therewith is inimical to the public interest, he may order a re-examination of the holder of the amateur operator's certificate with a view to it being determined whether the said certificate should be suspended or revoked by the Minister; and the Minister may take action accordingly.

20. The Minister may, at his discretion, revoke or suspend for such period as he deems fit any operator's certificate or any licence for a radio station where it is found that the operator or licensee at the date the certificate or licence was granted to him was ineligible or has since become ineligible for a certificate or licence, or where in his opinion the provisions of the regulations governing the issuance of a certificate or licence have been disregarded or violated, or where undue interference with the operation of any Government coast or ship station is found to result; the Minister may further order the confiscation or dismantling of the licensed apparatus in cases where, in his opinion, such action is warranted.

21. A licence shall not be granted for any radio station the operation of which, in the judgment of the Minister is likely unduly to interfere with the operation of any Government coast or ship station, or for any radio station, the erection and operation of which would in the judgment of the Minister, be inimical to the public interest.

22. The applicant for a licence for a radio station or for an operator's certificate shall be a British subject.

23. The applicant for a licence or for an operator's certificate shall have attained the age of fourteen years.

FEES AND CHARGES.

24. The annual fee to be paid in respect of licences issued by the Minister for the installation and operation of any class of radio station shall be as follows:—

(1) An amateur station for reception only (including reception from broadcasting stations) ..	5 0
(2) An amateur transmitting and receiving station, Grade II ..	£1 0 0
(3) An amateur transmitting and receiving station, Grade I ..	2 0 0
(4) An experimental transmitting and receiving station ..	3 0 0
(5) A private broadcasting station ..	2 0 0
(6) A toll broadcasting station ..	5 0 0

25. The fees to be paid in respect of examinations for an amateur operator's certificate, shall be as follows for each examination or re-examination:—

- (1) Amateur Operator, Grade I. 5s.
- (2) Amateur Operator, Grade II. 5s.

26. The fee to be paid in respect of a duplicate of an amateur operator's certificate, or of a radio station licence shall be 5s.

27. Where payment of the above-mentioned fees is not made on the due date the Minister shall not issue the said licence or certificate or, if issued, shall suspend or revoke the same as he may deem proper; provided that in the case of a recognised educational institution carrying out research work calculated to benefit the science of radio telegraphy, the Minister may, at his discretion, remit the annual licence fee.

CLASSIFICATION OF TRANSMITTED WAVES.

28. For the purpose of these regulations the various types of emissions are classified as under:—

(Type A.1) Continuous waves, key modulated; meaning continuous waves of which the amplitude or frequency is varied by the operation of keying as in telegraph transmission.

(Type A.2). Continuous waves, modulated at audio-frequency; meaning continuous waves in which the amplitude or frequency is varied in aperiodic manner at an audible frequency and commonly referred to as I.C.W.

(Type A.3). Continuous waves modulated by speech; meaning continuous waves in which the amplitude or frequency is varied according to the characteristic vibrations of speech.

(Type B.). Damped waves; this includes waves from spark transmitters or other types of transmitters having a characteristic decrement similar to the spark transmitters.

DAMPED WAVES (TYPE B.).

29. The use of damped waves is prohibited, except for research work on approved lines and subject to special written consent.

CALL SIGNAL.

30. Every radio station licensed hereunder to transmit radio communication shall, for purposes of identification, be allocated an official call signal by which the station shall be identified and which is to be used in the manner hereinafter given whenever a radio communication is caused to be transmitted from the said radio station.

31. For the transmission of any radio communication to any other licensed radio station, the procedure governing communications between ship stations and ship stations or ship stations and coast stations and outlined in article 25, sections 1 and 2 of the Detailed Service Regulations appended to the Radio Telegraph Convention, 1912, shall apply.

32. Where the transmissions are of an experimental character and not addressed to any specific station, the call signal shall be sent thrice, both at the commencement and at the close of each radio communication or connected series of radio communications.

33. The scheme of allocation of call signals shall be:—

(a) For a broadcasting station the number of the radio district in which the station is situated followed by the letter "Y" and one or more identification letters, e.g., 1 YA 3 YKG.

(b) For an amateur station, the number of the radio district in which the station is situated followed by two or more identification letters—e.g., 1 AA, 4 BOM.

(c) For an experimental station, the number of the radio district in which the station is situated followed by the letter X and one or more identification letters—e.g., 2 XAD 3 XTU.

34. Any licensee or operator who impersonates any other licensee or operator, or who improperly uses the call signal of another radio station, commits an offence against these regulations.

DECLARATION OF SECRECY.

35. Every licensee (other than an association or corporation) and every operator shall execute a declaration of secrecy to the effect that he will not divulge to any unauthorised person any information whatsoever relating to public correspondence that may come to his knowledge; and that he will by every means in his power seek to preserve the secrecy of the same. Such licensee or operator shall not commit to writing any public correspondence that may come to his knowledge, while exercising the powers conferred upon him by the licence. In the case of societies, institutes and similar bodies, all members of the body, having access to the apparatus shall execute the declaration of secrecy, and special care shall be taken to ensure that all the conditions of the licence, particularly those relating to secrecy of public correspondence, are strictly observed.

CONTROL OF RADIO STATION IN EMERGENCY.

36. If and whenever an emergency shall have arisen in which it is expedient in the public interest that His Majesty's Government shall have control over the transmission of radio communications by the licensed apparatus, it shall be lawful for any officer of His Majesty's Navy or Army or for any other person authorised in that behalf by the Admiralty or by the Minister, to take possession of or to dismantle or to cause the licensed apparatus or any part thereof to be taken possession of or to be dismantled in the name and on behalf of His Majesty, and to be used where such use may be deemed necessary for His Majesty's service, and subject thereto for such ordinary services as the said officer or person may deem fit; and in that event, any person authorised by the said officer or person may enter any radio station in which any such apparatus is installed and take possession of or dismantle the said apparatus and use the same as aforesaid.

INSPECTION DURING CURRENCY OF LICENCE.

37. The radio station must be open to inspection at all times by a District Radio Inspector, and every reasonable facility given for ascertaining the condition of the station and whether the regulations are being strictly complied with.

38. The licence of the radio station and the operator's certificate shall at all times be exhibited in a prominent place at the radio station.

NATURE OF RADIO COMMUNICATIONS.

39. A radio station licensed under these regulations shall not be used in any way to compete with Government communications services, and shall not transmit or receive radio communications, the transmission or reception of which is calculated in the judgment of the Minister to cause a loss of revenue to the Post and Telegraph Department.

40. The licensee or the operator shall not transmit any radio communication of a seditious, profane, obscene, libellous, or offensive nature.

41. The licensee or the operator shall not transmit any radio communication of a false or misleading character, and in particular shall not transmit any false SOS signal.

TRANSMITTING STATIONS TO BE EQUIPPED FOR RECEPTION.

42. An amateur experimental or broadcasting station shall be equipped for reception as well as for transmission, and shall observe the prescribed conditions relating to the keeping of

watch for the interference warning signal AAAAQRN; provided that this requirement may be waived by the Minister in the case of a broadcasting station, communication with which can be conveniently obtained by an adjacent coast station by means of a government telephone exchange connection.

INTERFERENCE.

43. The licensed radio station shall at all times be operated in such a manner as to avoid interference with other radio stations and in particular with Government and coast and ship stations. In this connection radio stations shall be guided by the principles laid down in Sections 1 and 2A of Article 7, and Sections 3, 4 and 5, of Article 24, of the Detailed Service Regulations appended to the Radio Telegraph Convention, 1912. Amateur and experimental transmissions shall be as brief as possible, and the duration of individual transmissions shall not exceed five minutes. Transmitters shall be disconnected from the radiating system when not actually in use for the transmission of signals.

44. Except where otherwise provided, licensees or operators of broadcasting stations and of amateur and experimental transmitting stations must, after every transmission or short series of transmissions, listen for the interference warning signal AAAAQRN (here follows a number indicating minutes), and transmitted by a Government station on 600 metres, and must immediately cease transmission upon receipt of the same until the time indicated has expired. The greatest care must be exercised in this connection on the part of the licensee or operator to avoid interfering with the receipt and handling by Government, coast, or ship stations of the international distress signal, SOS (•••—•••••), and of any radio communications that may be exchanged in connection therewith.

45. All the technical provisions of the licence of a radio station relating to power, wavelength, type of transmitter, and the like, shall be faithfully observed, and no unauthorised variation shall be made therein; and the station shall at all times be maintained at the highest possible degree of efficiency and selectivity.

SOS SIGNALS.—PROCEDURE.

46. If, in connection with his use of the authorised apparatus, any distress signal should come under the notice of the licensee or operator, and there is reason to believe that such signal has not been intercepted by a Government, a coast or a ship station, the licensee or operator shall immediately take such steps as may be available (e.g., by telephone) for communicating the same to the nearest Government station or, if this be impracticable, to a responsible officer of the Post and Telegraph Department.

TEMPORARY PERMITS FOR DEMONSTRATIONS.

47. In cases where temporary authority is sought for demonstrations of radiotelegraphy in connection with lectures, scientific proceedings, or the like, the Minister may, at his discretion, grant the necessary permission. Every care shall be taken to safeguard the secrecy of public correspondence, and only in special cases shall permission be given to operate transmitting apparatus connected to an antenna or earth.

LOG RECORD.

48. The licensee of a radio station licensed for transmission shall keep a log record showing the hours during which the authorised transmitting apparatus is in operation, and embodying a record of the reception of any special signal referred to in Regulation 46. This log shall be produced for perusal by the District Radio Inspector whenever required.

MISCELLANEOUS STATIONS.

49. Schools, colleges, institutes, societies and like bodies shall, in accordance with the object in view, be classified by the Minister in one or other of the amateur or experimental grades.

50. Portable radio stations shall be classified by the Minister in one or other of the amateur or experimental grades, and shall be subject to such additional conditions regarding field of operation and the like as the Minister may deem it necessary to impose.

ANTENNAE.

51. For experimental or research purposes, where communication with another station is not essential to the object in view, use shall be made as far as possible of transmitting circuits which do not radiate energy, or the radiation from which is reduced to a minimum.

52. No limitations shall be imposed regarding the type or dimensions of a transmitting antenna; provided that the requirements as to operating wavelengths are strictly complied with, and that no interference is caused with the operation of other radio stations by reason of the type or dimensions of antenna employed.

SPECIAL REGULATIONS GOVERNING AMATEUR TRANSMITTING STATIONS.

53. Licences for amateur transmitting stations shall be divided into two grades according to the purpose for which the station is intended and to the qualifications of the applicant.

54. A Grade I amateur transmitting station licence shall be granted to amateurs with a sufficient knowledge of or past experience in radiotelegraphy and or furnishing satisfactory testimonials from some recognised scientific or technological person or institution, and holding in addition a Grade I amateur operator's certificate; but in the case of an association or corporation the licensee, not being in possession of such a certificate, may employ a person holding an amateur operator's certificate of Grade I, or a certificate of a higher class, to operate the said station.

55. A Grade I amateur station shall be operated by a person holding a Grade I amateur operator's certificate, the qualifications for which are as follows:—

Proficiency in Morse operating, both sending and receiving, at the rate of ten (10) words per minute, five (5) letters comprising a word; an adequate knowledge of the principles and adjustment of the authorised radio apparatus and of the laws and regulations relating to the operation and conduct of amateur stations.

56. The following transmitting wavelengths shall, at the discretion of the Minister, be available for allocation to Grade I amateurs, but only such wavelengths shall be employed at any station as are specified in the station licence:—

- | | |
|---|-------------|
| (A) A general wave for all classes of service excepting Type B (damped waves) | 150 metres. |
| (B) A band of waves for radio telephony (Type A3) .. | 151-160 " |
| (C) A band of waves for I.C.W. (Type A2) .. | 161-170 " |
| (D) A band of waves for C.W. key modulated (Type A1) | 171-180 " |

57. At the discretion of the Minister the power permitted to Grade I amateur stations shall be 50 watts or under according to the qualifications and aims of the applicants. The power rating of radio transmitters shall be as determined by the Minister.

58. In cases where approved research work is being undertaken which would be facilitated by an extension of the powers conferred in the Grade I amateur station licence, the Minister shall, at his discretion, grant such temporary privileges as, in his opinion, may be necessary to cover the object in view.

59. A Grade II amateur station licence shall be granted to amateurs not possessing the requisite knowledge or experience in radio telegraphy to entitle them to a Grade I licence, but whose aims and qualifications are such as to justify the issuance of an amateur station licence, Grade II, and who hold, in addition, a Grade II amateur operator's certificate; but in the case of an association or corporation, the licensee not being in possession of such a certificate may employ a person holding an amateur operator's Grade II, or a certificate of a higher class to operate the said station.

60. A Grade II amateur station shall be operated by a person holding a Grade II amateur operator's certificate, or a certificate of a higher class. The qualifications for a Grade I amateur operator's certificate are as follows:—

Proficiency in Morse operating, both sending and receiving; at the rate of eight (8) words per minute, five (5) letters or figures comprising a word; an adequate knowledge of the principles and of the adjustment of the authorised radio apparatus, and the laws and regulations relating to the operation and conduct of amateur stations.

61. For Grade II amateur transmissions, a general wave of 140 metres shall be used for all types of waves, excepting damped waves (Type B), which are prohibited.

62. The maximum power permitted to Grade II amateur stations shall be five watts. The power rating of radio transmitters shall be as determined by the Minister.

63. Amateur transmissions shall not be made between the hours of 7 p.m. and 8 p.m. NZMT. The Minister may, at his discretion from time to time, impose such further restrictions as to the hours of transmission as he may deem necessary.

SPECIAL REGULATIONS AS TO AMATEUR RECEPTION (INCLUDING RECEPTION FROM BROADCASTING STATIONS).

64. The range of wavelengths for reception is unlimited.

65. The type and dimensions of an antenna intended for reception only are not limited by these regulations.

66. In the interest of radiotelegraphy generally the types of receiving circuits authorised by the licence shall not include those which, in the judgment of the Minister, unduly energise the receiving antenna. (Note.—An example of such types is that in which one coil of a two-coil tuner is used as a reaction coil inductively couple to the antenna coil).

SPECIAL REGULATIONS AS TO BROADCASTING STATIONS.

67. For the purposes of these regulations, broadcasting stations are classified as follows:—

- (A) "Private broadcasting stations" at which no charge is made for the broadcasting of radio communications;
- (B) "Toll broadcasting stations" at which a charge is made for the transmission of the broadcasted radio communications.

68. A licence for a broadcasting station may be granted to persons who, in the judgment of the Minister are qualified satisfactorily to conduct such a station in accordance with the requirements of these regulations.

69. The licensee of a broadcasting station shall not operate the said station unless he holds an amateur operator's certificate, Grade I, or a certificate of a higher class, which has been endorsed to authorise broadcasting operations; but the licensee not being in possession of such a certificate may employ an approved person holding a similar certificate so endorsed to assist in the operation of the said station; provided that in certain cases the requirements as to Morse operation shall be waived as indicated in regulation 42.

70. Broadcasting stations shall be classified and controlled by the Minister in such a manner as shall, in his judgment, reduce to a minimum mutual interference between adjacent broadcasting stations and render the service as widely available as possible.

71. At the following and/or at such other broadcasting centres as may be decided upon by the Minister the normal power of a broadcasting station shall be $\frac{1}{2}$ kilowatt and the wavelengths of transmission shall be as indicated hereunder or as may be varied by the Minister from time to time:—

	metres.		metres.
Whangarei ..	330	Wellington ..	275
Auckland ..	260	Nelson ..	335
Hamilton ..	360	Greymouth ..	265
New Plymouth ..	385	Christchurch ..	380
Gisborne ..	335	Timaru ..	330
Napier ..	380	Dunedin ..	370
Palmerston North ..	340	Invercargill ..	270

72. At the following and/or at such other broadcasting centres as may be decided upon by the Minister the normal power of a broadcasting station shall be $\frac{1}{2}$ kilowatt and the wavelengths of transmission shall be as indicated hereunder, or as may be varied by the Minister from time to time:—

	Metres.		Metres.
Kaitaia ..	220	Wanganui ..	220
Dargaville ..	190	Dannevirke ..	250
Thames ..	195	Masterton ..	195
Tauranga ..	225	Westport ..	195
Rotorua ..	190	Kaikoura ..	220
Whakatane ..	250	Oamaru ..	220
Te Kuiti ..	240	Queenstown ..	190
Taumarunui ..	210	Roxburgh ..	250
Hawera ..	190	Gore ..	195
Hastings ..	195		

73. The power rating of the radio transmitter of a broadcasting station shall be as determined by the Minister.

74. The antenna of a broadcasting station shall not be subject to restriction; provided the requirements as to operating wavelengths are strictly complied with and that no inherent interference is caused with the operation of other radio stations by reason of the type or dimensions of the antenna employed.

75. Where only one broadcasting station is licensed as a broadcasting centre the operating hours shall, subject to discretion of the Minister, be unlimited, but where more than one broadcasting station is licensed to operate at the same broadcasting centre, the Minister shall determine the hours of operation and shall be guided therein by consideration of the public interest.

76. On Sundays during the hours of 11 a.m. to 12.30 p.m. and 6.30 p.m. to 8 p.m. NZMT, priority shall be given to the broadcasting of religious services and kindred matter.

77. Subject to the provisions of regulation 78, neither direct nor indirect advertising shall be undertaken by broadcasting stations.

78. At the commencement of each separate item the broadcasting station shall repeat its call signal three times; and in addition thereto may announce the full name and address of the broadcasting station and make brief remarks relevant to the matter about to be transmitted.

79. Broadcasting stations shall not be used for the dissemination of propaganda of a controversial nature, but shall be restricted to matter of an educative or entertaining character such as news, lectures, useful information, religious services, musical or elocutionary entertainment, and such other items of general interest as may be approved by the Minister from time to time. The licensee of a broadcasting station shall not transmit radio communications, which, in the judgment of the Minister, do not come within the authority of this regulation, or do not conduce to the public interest.

SPECIAL REGULATIONS AS TO EXPERIMENTAL TRANSMITTING STATIONS.

80. A band of wavelengths from 390 to 410 metres shall, at the discretion of the Minister, be available for allocation to experimental stations, but only such wavelengths as are specified in the station licence shall be employed.

81. The normal power of an experimental station shall be 50 watts, the power rating of a radio transmitter shall be as determined by the Minister.

82. In cases in which an approved investigation is being undertaken which would be facilitated by an extension of the powers conferred in the experimental station licence, the Minister may, at his discretion, grant such temporary privileges as, in his opinion, may be necessary to cover the object in view.

83. An experimental transmitting station licence shall be granted only to a person of recognised attainments in the theory or practise of radiotelegraphy or to a body engaged in conducting experiments for the development of the science of radiotelegraphy.

84. The licensee of an experimental transmitting station shall not operate the said station unless he holds an amateur operator's certificate, Grade I, or a certificate of a higher class, but the licensee, not being in possession of such a certificate, may employ a person holding an amateur operator's certificate, Grade I, or a higher class, to assist in the operation of the said station.

85. The hours of transmission of experimental stations shall be as determined by the Minister.

PENALTIES.

86. Every licensee or operator who acts in contravention of or commits an offence against any of the provisions of regulations 34, 35, 40 or 41, shall be liable to a fine of £50 or to imprisonment for six months.

87. Every licensee or operator who act in contravention of or commits an offence against any of these regulations for which a penalty is not hereinbefore provided, shall be liable to a fine of £10 or to imprisonment for three months.

LICENCE TO ERECT AND OPERATE AN AMATEUR RADIO STATION FOR RECEPTION ONLY.

DOMINION OF NEW ZEALAND.

POST AND TELEGRAPH DEPARTMENT.

Registered No. (This licence expires)

J In pursuance and exercise of the powers and authority conferred upon the Minister of Telegraphs by the Post and Telegraphs Act, 1908, and the Post and Telegraph Amendment Acts, 1911,

1920 and 1922 respectively, and by the regulations made by the Governor-General in council on the 1922, for amateur, experimental and broadcasting stations, M is hereby licensed to erect an amateur station for the reception only, the said station (which is described in the schedule appended hereto) being situate at in the radio district of ; and to operate the said station for a period of twelve calendar months from the date hereof. The installation and operation of such radio station shall be carried out in accordance with the provisions of the regulations aforementioned, or such amendments and additions as may hereinafter be gazetted and, in addition thereto, shall be subject to such further restrictions and conditions as may from time to time be notified by the Minister of Telegraphs.

For the Minister of Telegraphs

Secretary, or Chief Telegraph Engineer.

SCHEDULE OF THE AUTHORISED RADIO STATION.

1. Name of licensee.
2. Location of station.

Signature of licensee.

Note.—No receiving circuit may be used which contravenes the provisions of regulation 66.

Licence issued in accordance with regulation 12.

Date: District Radio Inspector.

LICENCE TO ERECT AND OPERATE AN EXPERIMENTAL RADIO STATION.

DOMINION OF NEW ZEALAND.

POST AND TELEGRAPH DEPARTMENT.

Registered No. (This licence expires)

K In pursuance and exercise of the powers and authority conferred upon the Minister of Telegraphs by the Post and Telegraph Act, 1908, and the Post and Telegraph Amendment Acts of 1911, 1920 and 1922 respectively, and by the regulations made by the Governor-General in Council on the 1922, for amateur, experimental and broadcasting stations, M is hereby licensed to

erect an experimental station, the said station (which is described in the schedule appended hereto) being situate at in the radio district of and to operate the said experimental station for a period of twelve calendar months from the date hereof. The installation and operation of such radio station shall be carried out in accordance with the provisions of the regulations aforementioned or such amendments and additions as may hereinafter be gazetted, and in addition thereto shall be subject to such further restrictions and conditions as may from time to time be notified by the Minister of Telegraphs.

For the Minister of Telegraphs

Secretary, or Chief Telegraph Engineer.

SCHEDULE OF THE AUTHORISED RADIO STATION.

1. Name of licensee.
2. Location of station.
3. Call signal.
4. Types of transmission authorised.
5. Type of transmitter.
6. Power, watts.

7. Operating wavelength.
8. Authorised hours of transmission.
9. No. of operator's certificate.

(Signature of licensee.)

Note.—No receiving circuit may be used which contravenes the provisions of regulation 66.

Licence issue in accordance with Regulation 12.
Date _____ District Radio Inspector

LICENCE TO ERECT AND OPERATE AN AMATEUR RADIO TRANSMITTING AND RECEIVING STATION, GRADE....

DOMINION OF NEW ZEALAND.

POST AND TELEGRAPH DEPARTMENT.
Registered No. _____ (This licence expires _____)

In pursuance and exercise of the powers and authority conferred upon the Minister of Telegraphs by the Post and Telegraph Act, 1908, and the Post and Telegraph Amendment Acts of 1911, 1920 and 1922 respectively, and by the regulations made by the Governor-General in Council on the _____, 1922 for amateur, experimental and broadcasting stations M _____ is hereby licensed to erect an amateur transmitting station Grade _____ the said station (which is described in the schedule appended hereto) being situate at _____ in the radio district of _____, and to operate the said amateur station for a period of twelve calendar months from the date hereof. The installation and operation of such radio station shall be carried out in accordance with the provisions of the regulations aforementioned or such amendments and additions as may hereinafter be gazetted, and in addition thereto shall be subject to such further restrictions and conditions as may from time to time be notified by the Minister of Telegraphs.

For the Minister of Telegraphs,

Secretary, or Chief Telegraph Engineer.

SCHEDULE OF THE AUTHORISED RADIO STATION.

1. Name of licensee.
2. Location of station.
3. Call signal.
4. Types of transmission authorised.
5. Type of transmitter.
6. Power, _____ watts.
7. Operating wavelength.
8. Authorised hours of transmission.
9. No. of operator's certificate.

(Signature of licensee.)

Note.—No receiving circuit may be used which contravenes the provision of regulation 66.

Licence issue in accordance with Regulation 12.

Date _____ District Radio Inspector.

LICENCE TO ERECT AND OPERATE A RADIO BROADCASTING STATION.

DOMINION OF NEW ZEALAND.

POST AND TELEGRAPH DEPARTMENT.
Registered No. _____ (This licence expires _____)

In pursuance and exercise of the powers and authority conferred upon the Minister of Telegraphs by the Post and Telegraph Act, 1908, and the Post and Telegraph Amendment Acts of 1911, 1920 and 1922 respectively, and by the regulations made by the Governor-General in Council on the _____, 1922, for amateur, experimental and broadcasting stations, M _____ is hereby licensed to erect a

broadcasting station, the said station (which is described in the schedule appended hereto) being situate at _____ in the radio district of _____ and to operate the said broadcasting station for a period of twelve calendar months from the date hereof. The installation and operation of such radio station shall be carried out in accordance with the provisions of the regulations aforementioned or such amendments and additions as may hereinafter be gazetted, and in addition thereto shall be subject to such further restrictions and conditions as may from time to time be notified by the Minister of Telegraphs.

For the Minister of Telegraphs.

Secretary, or Chief Telegraph Engineer.

SCHEDULE OF THE AUTHORISED RADIO STATION.

1. Name of licensee.
2. Location of station.
3. Call signal.
4. Types of transmission authorised.
5. Type of transmitter.
6. Power, _____ watts.
7. Operating wavelength.
8. Authorised hours of transmission.
9. No. of operator's certificate.
10. Classification of station.
11. Nature of authorised communications.

(Signature of licensee.)

Note.—No receiving circuit may be used which contravenes the provisions of regulation 66.

Licence issued in accordance with Regulation 12.

Date _____ District Radio Inspector.
F. D. THOMSON,
Clerk of the Executive Council.

SAMOA POST AND TELEGRAPH AMENDMENT ORDER, 1923.

JELlicoe, Governor-General.

ORDER IN COUNCIL.

At the Government House at Wellington, this 12th day of February, 1923.

Present;

HIS EXCELLENCY THE GOVERNOR-GENERAL IN COUNCIL.

N His Excellency, the Governor-General of the Dominion of New Zealand, acting by and with the advice and consent of the Executive Council of that Dominion, and in pursuance of the authority to make regulations for the peace, order, and good government of the Territory of Western Samoa conferred upon him by the Samoa Act, 1921, and of all other powers and authorities enabling him in that behalf, doth hereby order as follows:—

1. This Order may be cited as the Samoa Post and Telegraph Amendment Order, 1923, and shall be read with and form part of the Samoa Post and Telegraph Order, 1920.
2. This Order shall come into force on the first day of March, one thousand nine hundred and twenty-three.

3. Notwithstanding anything to the contrary in the Samoa Post and Telegraph Order, 1920, the Radio Telegraph Regulations for Amateur Experimental and Broadcasting Stations, as published in the *New Zealand Gazette* of the eighteenth day of January, one thousand nine hundred and twenty-three, shall, subject to the provisions of this Order, apply to Samoa in the same manner as if that territory was part of New Zealand.

4. Clause 10 (a) and clause 22 of the said regulations shall have no force or effect in Samoa.

5. All powers conferred by the said regulations on the Minister of Telegraphs shall in Samoa be exercised by the Administrator, and all references in the said regulations to the Minister of Telegraphs, or to the Secretary, or to the District Radio Inspector, shall for the purposes of this Order be read as references to the Administrator, the Secretary to the Administration or the Superintendent, Apia Radio Station, as the case may be.

F. D. THOMSON.

Clerk of the Executive Council.

NICARAGUA

(See Map 44)

CONTROL.

THE control of wireless telegraphy and telephony is in the hands of the Government, under the direction of the Minister of Public Works and the Director-General of Communications.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
General Fernando Solórzano	Minister for Public Works	Managua.
Mr. Paulino Solórzano ..	Director-General of Communications	Managua.

ORGANISATION.

With regard to wireless telegraphy, none of the installations at present existing in Nicaragua is owned by the Government. The United States Government possesses a station in Managua, the capital of the Republic, and there are two stations owned by private companies on the Atlantic Coast. These stations (with the exception of that owned by the American Government) have been erected under contract with the Government of the Republic, and are subject to the provisions of the London Radiotelegraphic Convention of 1912. Only one of them is open to public service with ships.

Another wireless station, which will be erected in, or in the neighbourhood of the town of Managua, will be used for public correspondence for both land and ship stations.

A receiving station has been installed at the Administration General of Communication for press and time (75 meridian) messages.

ADMINISTRATION.

The Nicaraguan Government has granted a concession to the Tropical Radio Telegraph Co. for the installation and exploitation of wireless stations in the country for public use.

NIGERIA

(See Maps 24 and 26)

CONTROL AND ORGANISATION.

THERE is only one wireless station in Nigeria—at Lagos—erected by the African Direct Telegraph Company in 1912. It is open to public service with ships. The Postmaster-General controls the wireless services.

There are no wireless societies or clubs, nor are any licences issued at present for private installations or stations.

ADMINISTRATION.

Wireless telegraphy is administered under:—

A—The Wireless Telegraph Ordinance.

B—Regulations made under the Wireless Telegraph Ordinance.

THE WIRELESS TELEGRAPHY ORDINANCE.

A 1. *Short Title.*—This Ordinance may be cited as the Wireless Telegraphy Ordinance.

2. *Definition.*—Definition: "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received.

3. *Licence for Wireless Telegraphy.*—(1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in Nigeria except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. *Apparatus Aboard Ships to be Worked in Accordance with Regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of Nigeria, otherwise than in accordance with regulations made under this Ordinance.

5. *Regulations.*—(1) The Governor may make regulations for carrying into effect the purposes of this Ordinance.

(2) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of Nigeria shall be subject to such further Regulations as may be made by the Governor and such Regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf, or contrary to the provisions of any Regulations made under this Ordinance or of any licence granted under this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by a superior officer and named in the warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship, and to seize any appara-

tus which appears to him to be used or intended to be used for wireless telegraphy thereon.

7. *Penalties and Procedure.*—Any person who shall offend against any provision of this Ordinance or any of the Regulations made thereunder shall be liable to a fine of fifty pounds, and the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

8. *Saving Section as Regards Electrical Apparatus.*—Nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than that of wireless telegraphy.

REGULATIONS MADE UNDER SECTION 5 OF THE WIRELESS TELEGRAPHY ORDINANCE.

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of Nigeria shall be worked in such a way as not to interfere with:—

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed or worked in Nigeria or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay or waters of Nigeria except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

NORWAY

(See Maps 2, 9, and 15.)

NORWAY is a constitutional monarchy, the reigning sovereign being King Haakon VII.

CONTROL.

Radiotelegraphy is organised under the supervision of the Telegraph Department; whilst for naval and military purposes the War Office and Admiralty exercise jurisdiction over their own wireless section.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Capt. Niels Stockfleth Schultz Nickelsen	Director-General of Posts and Telegraphs ..	Oslo
Mr. Hermod Peterson	Radio Engineer and Chief of Wireless Department	Oslo (Telegraph Department)
Comdr. J. Bull ..	Director of Mining Department of the Navy	Horten (Navy Yard)
Comdr. F. Bugge ..	Inspector Wireless Department of the Navy	Horten (Navy Yard)

ORGANISATION.

The latest available statistics enumerate :—

Stations for public service to ships	10
Stations for Government traffic only	3
Stations for public service	19
Stations for public service radio telephony	4
Stations for Transatlantic public traffic	1
Stations under construction	1
Installation on Norwegian merchant vessels	about 540

Two Norwegian companies have been formed under the titles of "Norsk Marconi Kompani A/S" at Oslo, and Norsk Telefunken-Radioaktieselskap. The former company is working in conjunction with Marconi's Wireless Telegraph Co., Ltd., London, and has the sole rights of the Marconi patents for Norway. The latter is working in conjunction with the Telefunken Company.

There has recently been formed a wireless club called Norsk Radio Klub. A Broadcasting Company is in formation and the first station will be erected in Oslo.

ADMINISTRATION.

The Laws and Regulations under which wireless is administered in this country appear in the following pages in accordance with the list appended hereto :—

A—Law of July 24th, 1914.

B—Law of August 18th, 1914.

C—Regulations.

D—Ship Licence.

E—Certificate for Wireless Telegraphists.

F—Agreement between Telegraph Administration of Norway, Denmark and Sweden regarding expeditious forwarding of radiotelegrams.

LAW OF JULY, 1914.

A Law of July 24th, 1914, supplementing and amending the Law of April 29th, 1899, relating to the forwarding of communications by aid of telegraphic conductors or such like installations and relating to the repeal of Law No. 2 of July 16th, 1907 :—

Section 1.—On ships which sail under the Norwegian flag and which do not belong to the Norwegian family, stations or installations for telegraphing or telephoning by wireless both within and without the boundaries of the Kingdom may only be installed and worked after an authorisation obtained in advance, which will be granted by the King, or whoever may be authorised thereto, on certain definite conditions for a stipulated period of time. The permission may at any time be withdrawn if the conditions imposed are not adhered to.

Detailed Rules and Regulations relating to the fitting up and working of such stations or installations shall be drawn up by the King.

On ships which sail under a foreign flag and are within Norwegian territorial waters wireless telegraphing and telephoning can only

be carried on—even if they have permission for same from the authorities of the foreign country—subject to observance of the provisions which are made with respect thereto by the King or whomsoever he may have authorised for the purpose, who may, moreover, forbid all telegraphing or telephoning from such ships, whenever circumstances may be considered to require it.

The King may determine that import and sale in the country or letting of apparatus or parts of apparatus for transmission or reception by radiotelegraphy or radiotelephony shall be depending on special permission, which will be given by the King or whomsoever he may authorise hereto.

Further directions as to the conditions whereupon such permissions are granted shall be drawn up by the King.

Doubts as to what is meant by "parts of apparatus" after this law are decided upon by the King or whomsoever he may authorise hereto.

Section 2.—The exceptions mentioned in the Law of April 29th, 1899, under Section 1,

2nd paragraph, relating to the working of plant which may be used by a commune or private person for his own use, or such as railways may install for their own working, shall not apply so far as the working of installations for wireless telegraphy or telephony are concerned.

Section 3.—Any infractions of the aforementioned conditions shall be punished pursuant to the provisions laid down in the Law of April 29th, 1899, Section 6.

Moreover, any transgression of the rules or provisions which are drawn up with regard to Section 1 of the present Law shall be punished by fines.

Section 4.—This Law shall come into force immediately. The Law of July 16th, 1907, containing additions and amendments to the Law of April 29th, 1899, relating to the forwarding of communications by means of telegraph lines or similar installations, is hereby repealed.

LAW OF AUGUST, 1914.

B The following paragraph, taken from the "Law of August 18th, 1914," amending the Law of April 29th, 1899, relates directly to Wireless Telegraphy:—

Within the boundaries of Norway, or its territorial waters, stations and installations for wireless telegraphy and telephony may only be erected or worked after permission has been obtained from the King or whomsoever he may authorise thereto, and on such conditions as are laid down in the said permission.

REGULATIONS.

C The following regulations are based on the Law of July 24th, 1901:—

1. Within the limits of Norwegian territorial waters radiotelegraphic or radiotelephonic stations on board foreign ships must not be used without special licence, unless it concerns:—

(1) Correspondence regarding ships in distress or in order to prevent accidents.

(2) Correspondence with the nearest Norwegian coast station.

(3) Correspondence with other ship stations provided each of the ships are at least 10 nautical miles from the nearest Norwegian coast station.

In the cases (2) and (3) the correspondence shall at once be suspended if it is required by the Telegraph Department, the Marine Department, or by any one of the radio stations under their authority.

2. In Norwegian ports, where official radio stations are established, and within territories which at any time may be determined by Norwegian authorities, and about which information may be obtained at the nearest official coast station, the ship station must not be used for other correspondence than mentioned in para. 1 (1), unless special permission is obtained.

3. Requests for permission to use the radio stations within the Norwegian territorial waters for other correspondence than mentioned above must be sent to the Telegraph Department, which takes its decision after conference with the Marine Department.

4. However, the preceding provisions do not, with the following exceptions, apply to stations on board foreign ships of war. Provided the ships enter Norwegian ports, where official radio stations are established (see the list published by the Telegraph Department), and wish to make use of the radio apparatus on board, they shall first apply to the manager of the official radio station at the place, which will inform it what times it is permitted to use the apparatus.

In this application, which can be made by radio, the wavelength which it is wished to use shall be stated.

In Norwegian ports and territorial waters such vessels may otherwise freely use their radio stations. The correspondence must, however, at once be suspended, when it is required by the Telegraph Department, the Marine Department, or by any one of the stations under their authority.

5. Whenever the radio station is used during the stay of the ship in Norwegian waters, this shall be done subject to the regulations contained in the International Telegraph Convention, with the rules pertaining thereto.

6. The above-mentioned regulations are only applicable when Norway is not at war, and only to the ships of non-belligerent foreign forces.

7. The preceding regulations come into force from September 1st, 1922. From the same date the previous regulations approved by the Royal Decree of October 23th, 1908, are repealed.

NORWEGIAN LICENCE CONDITIONS.

D Conditions for erection and working of Radiotelegraph and Radiotelephone stations on board ships (ship stations).

FORM OF LICENCE.

According to the Law of 24th July, 1914, and the Royal Decree of the 30th August, 1913, permission is hereby given to.....

..... to erect and work on board the ship..... a Radiotelegraph Station (Radiotelephone Station) in accordance with the Table of Particulars on the last page of this form. The permission is valid from..... to..... and is given on the following conditions.

1. The station shall belong to the..... class of stations as specified in the International Radiotelegraph Convention Service Regulations, Art. XIII b, and will thus have..... service.

2. The installation shall be effected in every respect in accordance with the installation plan approved by the Telegraph Department, and must not be departed from without the agreement of the said department. Ships belonging to the 1st and 2nd classes must be provided with emergency Radiotelegraph installations, as laid down in the existing Radiotelegraphic Service Regulations.

3. The holder of the licence shall, as far as the erection and working of the station is concerned, be under the obligation in every respect to adhere to existing international agreements with annexed regulations concerning Radiotelegraph and Telephony when such International agreements have been adhered to by Norway, and further he shall abide by such regulations as may be issued by the Department for Public Works or by the Telegraph Department.

4. The Telegraph Department shall have the right, in the interests of the service and (after conferring with the Naval Department) to require any alterations to be made in the wavelengths employed as given in the above-mentioned Table of Particulars within the limits laid down in the regulations either as a temporary or permanent measure in the working of the station.

5. The holder of the licence shall recognise the importance of keeping the station in the best possible conditions in order to ensure good working.

6. The station shall be under the obligation to forward telegrams to and from persons on board, with due regard to existing general rules for such work. Further, the station shall be obliged to communicate with other ship or coast stations without regard to the system of apparatus employed at those stations.

7. The answering of signals from ships in distress and the correspondence caused thereby shall have priority over all other correspondence.

8. During the ship's stay in a Norwegian Port the station must not be used for communication either with Norwegian or with Foreign coast stations. Neither shall the station, while the ship is in a Norwegian port, be used for communication with other ship stations without special permission, or unless such communication is effected with a view to prevent accidents. Special permission is granted by the Telegraph Department after conferring with the Naval Department.

9. The call signal of the station is.....

10. The tax due to the ship station is.....
(ore (..... centimes) per
 word with a minimum of.....(ore)
 (.....centimes) per message.

11. The service on board must be performed by one telegraphist, or, for ship stations of class I, by two or more telegraphists holding a certificate issued by the Telegraph Department.

This certificate states that the telegraphist concerned possesses the knowledge and abilities as prescribed in the existing International Regulations.

The granting of such certificate depends upon the passing of an examination arranged by the Telegraph Department. Petty Officers and Seamen belonging to the Navy's staff of mechanics, and who are specially trained as Radiotelegraphists for the Navy, are entitled to such certificate when they can prove to the Telegraph Department that they have the necessary knowledge of the handling of telegrams and when they procure from the authority concerned in the Navy, a testimonial to the effect that they satisfy the International Regulations as far as their knowledge of the instruments, ability, etc., is concerned. Without the permission of the Telegraph Department other than Norwegian subjects must not be employed for the service on board.

The holder of the licence must take the best possible care that the contents of messages do not come to the knowledge of unauthorised persons.

The telegraphist must make the usual promise of secrecy.

12. The holder of the licence is responsible for the charges that are due for the transmission of the messages sent from the ship station, including the charge for the coast station.

The Telegraph Administration, on its side, pays to the holder of the licence the charges that are due to the ship station for the messages addressed to the ship. "Journals" (abstract) should be kept in respect of the correspondence (traffic). These "Journals," together with the originals of the transmitted messages and such other documents as may be required, are to be sent to the Telegraph Department, as far as possible, at the end of each month.

The mutual settlement of the charges will take place quarterly or monthly, as may be arranged between the Telegraph Department and the holder of the licence. However, with the agreement of the Telegraph Department

the holder of the licence may make other arrangements for the accounting of stations on ships that are exclusively engaged in foreign waters. Such arrangements may be made with the Administrations owning the coast stations that the ships usually make use of. Similarly, the Telegraph Department may make arrangements other than those mentioned above with Foreign Administrations.

13. The station is subject to such supervision as may be decided by the Department for Public Works, and one or more of the Officials appointed by the Department for Public Works or by the Telegraph Department should be given opportunity to inspect the station.

For the supervision of the station the holder of the licence has to pay a certain fee that will be decided by the Department.

14. When State or other public reasons so demand it, the Department for Public Works or the Naval Department may partly or entirely prohibit the transmission of any kind of traffic correspondence at the station without admitting any claim for compensation. Likewise, in the interests of the service, the Telegraph or Naval Department can prohibit with the same effect all correspondence from the station, either at certain places or at certain times of the day.

15. The Norwegian State has the right to take over the station with six months' notice against compensation, the amount of which will be fixed after valuation, should it not be possible to arrive at an amicable adjustment.

The valuation will be made by a Committee of three members, whereof one member is nominated by the owner, one by the Telegraph Department and one by the Department for Public Works.

The member nominated by the Department for Public Works will be the Chairman of the Committee.

The questions put before the Committee will be decided solely by a majority of votes.

In case the owner has not, within thirty days after the reception of the invitation, made any such nomination as mentioned above, or in case the member nominated by him fails to attend, the valuation will then with obligatory effect be decided by the other nominees.

In case of equal voting the vote of the Chairman shall decide the matter.

In the valuation regard shall only be paid to the technical value of the station at the moment of valuation, the income, etc., derived from the station not being taken into account.

The valuation shall take place within a time-limit fixed by the Telegraph Department and will be at the public expense.

16. The licence shall become null and void in case:—

(a) Use is not made of it within a year of its issue.

(b) Breach is made of any of its regulations.

(c) The ship ceases to fly the Norwegian flag.

17. Disputes as to the intent and meaning of this licence shall, with obligatory effect, be decided by the King.

The Telegraph Department,

Oslo.....19.....

SCHEDULE.

System	Type of Installation.	Normal range (by day).	Wave-lengths (the normal wave to be underlined).	Description of Power Supply.	Description of Transmitting and Receiving Instruments. (Detailed sketch of connections attached.)	Type of Aerial (Sketch with measurements attached).	Description of Emergency Gear for ship stations of 1st and 2nd classes. (Detailed sketch of connections attached.)	Remarks

CERTIFICATE.

E It is hereby testified that..... has in a satisfactory manner passed the test for radiotelegraphists, ordered by the Telegraph Administration, comprising:—

(a) Management of apparatus, and knowledge of their action.

(b) Transmitting and receiving by the ear with the speed ordered for a certificate of.....Class.

(c) Regulations.

With reference to above, and as..... has made the promise of secrecy fixed for telegraph officials, there is hereby given to..... a certificate of.....Class, as radiotelegraphist on board ships.

The Telegraph Administration,
Oslo, the.....

shall as a rule send its radiotelegrams to the nearest coast station, radiotelegraph stations on board ship flying the Norwegian, Danish or Swedish flag are entitled to send to the nearest coast station of the ship's homeland such radiotelegrams as are addressed to that country subject to the following conditions:—

1. That the ship is at least 25 nautical miles from any other coast station open for general correspondence.

2. That the ship's distance from the coast station concerned is not greater than the distance from any other coast station situated in a country other than Norway, Denmark or Sweden and open for general correspondence.

3. That transmissions cease immediately at the request of a nearer coast station whose correspondence is being disturbed by such transmissions, and

4. That the provisions of the International Radiotelegraph Convention and the annexed Service Regulations be maintained in other respects.

This Agreement which is executed in three copies and in each of three countries' languages comes into force on the 1st January, 1921, and shall remain in force indefinitely and until three months from the day on which it shall have been determined by one of the contracting parties.

Christiania, the.....December, 1920.
The Royal Norwegian Telegraph Administration.
Copenhagen, the.....December, 1920.
The Royal Danish Telegraph Administration.
The Stockholm, the.....December, 1920.
Royal Swedish Telegraph Administration.

AGREEMENT

REGARDING CERTAIN EXCEPTIONS TO THE PROVISIONS OF ARTICLE XXXV OF THE SERVICE REGULATIONS ANNEXED TO THE INTERNATIONAL RADIOTELEGRAPH CONVENTION.

F With a view to securing a more expeditious forwarding of radiotelegrams from a ship to its homeland, the following Agreement has been concluded between the Royal Norwegian, the Royal Danish, and the Royal Swedish Telegraph Administrations, subject to the necessary sanctions:—

Notwithstanding what is stipulated in Article XXXV para. 1 of the service regulations annexed to the International Radiotelegraph Convention, according to which a ship station

NYASALAND PROTECTORATE.

(See Maps 25 and 31)

THIS Colony is administered (under the Colonial Office) by the Governor and Commander-in-Chief, assisted by an Executive and a Legislative Council.

ADMINISTRATION.

Wireless telegraphy is not at present in operation, although permits to import receiving sets have been granted. Provision has been made in the Statute Book for its regulation, as follows:—

WIRELESS ORDINANCE, 1908.

1. This Ordinance may be cited as "The Wireless Telegraph Ordinance, 1908."

2. No person shall establish or use any apparatus or installation for the purpose of operating wireless telegraphs without a licence from the Governor.

Any person contravening this section shall be liable on conviction to a fine not exceeding £100 or to imprisonment with or without hard labour for a term not exceeding twelve months with or without the option of a fine, and in addition any apparatus or installations in respect of which an offence under this section is

committed may be forfeited and sold or disposed of as the Governor may direct.

3. The Governor in Council may from time to time make, and when made shall publish in the *Gazette*, rules prescribing the terms and conditions upon which licences to establish or use apparatus or installations for the purpose of operating wireless telegraphs may be granted,

and may impose a penalty on conviction for breach of any rules so made of a fine not exceeding £50 or imprisonment with or without hard labour for a term not exceeding six months with or without the option of a fine, and such rules may further provide for forfeiture, and sale or disposal as the Governor may direct of any such apparatus or installations as aforesaid.

PACIFIC ISLANDS

(See Map 56.)

Including :

Tonga (Friendly Islands, under British Protection) Ducie Islands, Gilbert and Ellice Islands Colony, British Solomon Islands, Starbuck Islands, Malden Island, Baker Islands, Palmyra.

JAPANESE—The Marianne (Ladrone) Islands, The Caroline Islands, Marshall Islands.

TONGA ISLANDS (Friendly Islands)

THE Tonga Islands are under the protectorate of Great Britain, as proclaimed on May 19th, 1900. The present Sovereign is Queen Salote, who is assisted by a Legislative Assembly.

CONTROL.

A department of Telegraphs and Telephones was inaugurated at the time of the erection of the wireless station, under whose jurisdiction fall all matters concerning radiotelegraphy and telephony.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. J. R. Land	Supt. of Telegraphs and Telephones	Nukualofa
Mr. H. C. Melville	Wireless Officer	

ORGANISATION.

The station of Nukualofa is owned and controlled by the Tongan Government and handles commercial traffic. The station works with Suva (Fiji), Apia (Samoa) and ships.

Telegrams are delivered between the hours of 9 a.m. and 4 p.m. No portorage charge is imposed on delivered telegrams. These are delivered within a one-mile radius of the wireless station. Telegrams for persons residing outside the mile radius are either posted to the addressee or delivered to an authorised agent residing within the mile radius. Received telegrams may also be telephoned to subscribers to the Telephone System free of charge.

In accordance with a general scheme for weather forecasting in the South Pacific, Nukualofa makes daily observations, at 0330 G.M.T. Civil of Barometer reading, Wet and Dry Bulb Thermometers, Direction and force of wind (Beaufort scale) and state of Sky and Weather (in Beaufort letters), and forwards same to Apia on 680 metres at 0815 G.M.T. Civil.

During the hurricane months (November to April inclusive) observations as above are also made at 2030 G.M.T. Civil and forwarded to Apia on 680 metres at 2130 G.M.T. Civil.

In the event of local stormy weather warning is broadcasted by Nukualofa for the information of ships in the vicinity.

All weather telegrams are handled free of charge.

ADMINISTRATION.

As regards the European population, Tonga comes under King's Regulation No. IX of 1912. (See Gilbert and Ellice Colony.) The use of wireless

stations on merchant ships is controlled by the "Wireless Telegraphy Rules, 1917," made under the above-mentioned King's Regulation. An Ordinance is in force regulating the use of wireless by Tongan natives.

A—An Ordinance to govern the use of wireless telegraphy in the Kingdom of Tonga. (No. 5 of 1918.)

B—Form of Experimental Licence.

AN ORDINANCE

TO GOVERN THE USE OF WIRELESS TELEGRAPHY IN THE KINGDOM OF TONGA. (No. 5 of 1918.)

A Be it enacted by the King by the advice and with the consent of the Privy Council as follows:—

1. The short title of this Ordinance shall be The Wireless Telegraphy Ordinance, 1918.
2. It shall not be lawful for any Tongan to establish maintain or use in the Kingdom of Tonga any apparatus or instrument for the purpose of electrical communication by means of wireless telegraphy without having previously obtained from the Privy Council a licence in that behalf to be granted on such terms and conditions as may be prescribed by any rules made under this Ordinance and on such other terms and conditions as the Privy Council may from time to time think fit to prescribe.
3. It shall be lawful for His Majesty the King in Council from time to time to make rules:—
 - (a) Prescribing the manner in which licences under this Ordinance are to be applied for and granted and the fees payable on the grant of such licence.
 - (b) Generally for the purpose of carrying this Ordinance into effect.
4. Any person who contravenes the provisions of this Ordinance or of any rules made hereunder or fails to observe or perform the terms or conditions of a licence granted hereunder or prescribed by any rules aforesaid shall be liable on conviction to a fine not exceeding fifty pounds or in default of payment to imprisonment for any term not exceeding six months and the apparatus or instrument in respect of which such conviction was obtained may by order of the magistrate before whom such conviction was obtained be forfeited.
5. All proceedings under this Ordinance may be taken before a Police Magistrate and the mode of procedure shall be according to the law in force for the time being in respect of other offences punishable on conviction before a Police Magistrate.

March 5th, 1918.

LICENCE TO USE WIRELESS APPARATUS. FOR EXPERIMENTAL PURPOSES ONLY.

GRANTED BY THE HIGH COMMISSIONER FOR THE WESTERN PACIFIC IN PURSUANCE OF SECTION 3 OF KING'S REGULATION NO. IX OF 1912.

- B**
- (1) PERMISSION is hereby granted to of hereinafter called the licensee, to establish, install and operate at , apparatus for the transmission and reception of wireless telegraphy and radiotelephony provided that the apparatus installed shall be of the character specified in the Schedule hereto.
 - (2) That the apparatus shall be worked and the messages shall be transmitted and received solely for the purpose of conducting experiments in wireless telegraphy or radiotelephony and for no other purpose.
 - (3) The apparatus shall be so worked as not to interfere with the working of any wireless telegraph station established in the Kingdom of Tonga or the territorial waters abutting on the coasts of the Kingdom.

(4) With a view to preventing such interference as in (3) the Licensee shall comply with all directions given him by the Superintendent of Telegraphs, Tonga, with respect to avoiding interference between one wireless telegraph station and another.

(5) The apparatus shall not, without the consent in writing of the Superintendent of Telegraphs, be altered in respect of any of the particulars mentioned in the Schedule hereto.

(6) The Licensee shall at all times indemnify the Government against any action, claims or demands, which may be brought or made by any corporation, company or person, in respect of any injury arising from any act, licensed or permitted, by this authority.

(7) The Licensee shall not, by the transmission of any message by means of the apparatus or otherwise by the use of the apparatus, interfere with Naval signalling.

(8) Neither the Licensee or any person on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to his knowledge or to the knowledge of any such person as aforesaid and intercepted by him from any wireless telegraph station.

(9) The Superintendent of Telegraphs or his agents or assistants may, from time to time, and at all reasonable times, enter upon the premises wherein the apparatus is installed for the purpose of inspecting such apparatus, and the Licensee shall afford all requisite and proper facilities for such inspection.

(10) Except with the consent in writing of the Superintendent of Telegraphs aforesaid the Licensee shall not assign, underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the permission herein granted.

(11) If and whenever in the opinion of the Government of Tonga an emergency shall have arisen in which it is expedient for the public service that the Government of Tonga shall have control over the transmission of messages by the apparatus, it shall be lawful for the Superintendent of Telegraphs to cause the apparatus or any part thereof to be taken possession of in the name and on behalf of the Government and to be used for Government service and in that event any person authorised by the Superintendent of Telegraphs may enter upon the premises and take possession of the apparatus and use the same as aforesaid for such time as considered necessary provided always that the apparatus shall remain the property of the Licensee.

(12) The Government may in its absolute discretion give notice in writing of the withdrawal of the permission herein granted and at the end of one calendar month from the date of such notice the apparatus shall be disconnected to the satisfaction of an officer of the Telegraph Department, and, at the discretion of such officer, part thereof may be removed from the premises and be held by the Government during such period as considered necessary or expedient. All or any apparatus so removed shall remain the property of the Licensee. In

the event of withdrawal of permission herein referred to it shall not be incumbent on the Government to give its reasons for so doing.

(13) No improper signals, such as those of distress or geographical positions calculated to cause apprehension are to be made by means of the apparatus.

(14) In case of any breach, non-observance or non-performance by the Licensee of the con-

ditions herein contained and on his part to be observed and performed, the Superintendent of Telegraphs may in writing revoke the permission herein granted.

GIVEN under my hand this day of
19 , at

High Commissioner for the
Western Pacific.

Suva, Fiji.

GILBERT AND ELLICE ISLANDS COLONY

BY the "Gilbert and Ellice Order in Council, 1915," these Islands, together with all small islands, islets, rocks and reefs, depending on them, were annexed to and form part of His Majesty's Dominions, and are known as the "Gilbert and Ellice Islands Colony." The Administration of the Group is vested in a Resident Commissioner, who is responsible to the High Commissioner for the Western Pacific, with headquarters on Ocean Island.

CONTROL AND ORGANISATION.

Radiotelegraphy is a Government monopoly, though licences may be granted for private erection and working. There are four wireless stations in the group, viz.: Ocean Island, Tarawa, Fanning, and Washington Islands. The two latter stations, which are privately owned by the Fanning and Washington Islands Trading Company, are not at present in operation. Tarawa is owned and operated by Messrs. Burns, Philp & Co.

Ocean Island is the only Government land station, being operated and controlled by the Government of the Colony.

This station works with Suva, Tulagi, Rabaal, Nauru and Tarawa.

Telephony stations are being erected for the British Phosphate Commission for communication with Nauru.

There are no existing or projected stations designed for aviation or meteorological purposes and no time or weather programme is in force at any of the existing stations.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. G. L. G. Tilford ..	Engineer-Operator in Charge	Ocean Island

ADMINISTRATION.

The following are the rules and regulations at present in force:—

A—King's Regulation No. IX of 1912.

B—Rules under the provisions thereof.

KING'S REGULATION No. IX OF 1912. TO GOVERN THE USE OF WIRELESS TELEGRAPHY IN THE WESTERN PACIFIC.

A 1. This Regulation may be cited as "The Wireless Telegraphy Regulation, 1912."

2. The Wireless Telegraphy Regulation, 1907, is hereby repealed.

3. (1) It shall not be lawful for any person to establish, install or use any apparatus for the purpose of electrical communication by means of wireless telegraphy in any protectorates, islands, or places within the jurisdiction of the High Commissioner for the Western Pacific specified in the schedule hereto without a licence to do so first obtained from the said High Commissioner.

(2) A licence under this section shall be subject to such terms and conditions as may be prescribed by any rules made under this regulation

and to such other terms and conditions as the High Commissioner may from time to time prescribe.

4. The High Commissioner may make rules from time to time to carry out the provisions of this regulation and in particular to regulate the use of apparatus for wireless telegraphy on board merchant ships, whether British or foreign vessels, while in the territorial waters of the protectorates or islands or places aforesaid.

5. Any person who contravenes the provisions of this Regulation or of any rules made hereunder, or fails to observe and perform the terms and conditions of a licence granted by the High Commissioner hereunder or prescribed by any rules aforesaid, shall be liable to a penalty not exceeding one hundred pounds and to the forfeiture of any apparatus established, installed or used for the purpose aforementioned.

6. This Regulation shall not apply to the islands of the Pacific Ocean known as the New Hebrides, including the Banks Islands and Torres Islands.

SCHEDULE.

The British Solomon Islands Protectorate, The Gilbert and Ellice Islands Protectorate, The Union (Tokelau) Islands, The Phoenix Islands, Fanning Island, Washington Island, Christmas Island and all other islands in the Western Pacific not being within the jurisdiction of the Commonwealth of Australia or any of the states thereof or of the Dominion of New Zealand or of any civilised Power.

B RULES TO REGULATE THE USE OF WIRELESS TELEGRAPH APPARATUS ON MERCHANT SHIPS IN THE WESTERN PACIFIC, MADE BY THE HIGH COMMISSIONER UNDER THE PROVISIONS OF THE WIRELESS TELEGRAPHY REGULATION, 1912.

1. These rules may be cited as the Wireless Telegraphy Rules, 1917.

2. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the protectorates, islands and places specified in the Schedule to the Wireless Telegraphy Regulation, 1912, shall be worked in such a way as not to interfere with—

(a) Navalsignalling; and

(b) The working of any wireless telegraph station, lawfully established, installed or worked in those protectorates, islands or places or the territorial waters thereof;

and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

3. (a) The apparatus for wireless telegraphy on board a merchant ship shall not be worked whilst such ship is within a harbour in any colony, protectorate or island specified in the

Schedule to the Wireless Telegraphy Regulation, 1912.

(b) For the proper enforcement of the above every ship of British register in any such harbour shall completely disconnect its aerial wires from its radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected.

(c) Every ship of foreign register in any such harbour shall, subject to the provisions of the following subsection (d) take down its aerial wires completely and disconnect the same from its radiotelegraph apparatus.

(d) A ship of foreign register remaining in any such harbour for less than twelve hours, may, at the discretion of the Resident Commissioner or other Government officer in charge of the colony, protectorate or island to which such harbour belongs, be permitted to leave its aerials up, provided the same are disconnected in accordance with the provisions of subsection (b) of this rule.

4. If at any time, in the opinion of the High Commissioner, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters aforesaid shall be subject to such further rules as may be made by the High Commissioner from time to time, and those rules may prohibit or regulate that use in all cases or in such cases as may be deemed desirable.

5. It shall be the duty of the master of a ship to see that the requirements of these rules are carried out.

6. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. The rules made on December 16th, 1912, are hereby repealed.

Dated this twenty-ninth day of August, 1917.

MARIANNE (LADRONE), CAROLINE, MARSHALL ISLANDS

BY the Treaty of Versailles, Japan obtained mandatory of the former German possessions north of the equator, their population being largely Japanese.

The station at Guam, Marianne Islands (See Map 22), is owned and operated by the U.S. Navy.

PALESTINE

(See Maps 3, 16, 25, 27.)

THE Government is in the hands of a High Commissioner assisted by an Advisory Council.

CONTROL AND ORGANISATION.

There are no Government or commercial wireless stations in the country. Wireless traffic is transmitted *via* Egypt, the charges being similar to those in force in Lower Egypt, with the addition of a terminal charge at the usual international rates.

ADMINISTRATION.

We print below the text of the Wireless Telegraphy Ordinance 1924, and a copy of the provisional licence for reception issued under that ordinance.

A—Wireless Telegraphy Ordinance 1924.**B—Form of Receiving Licence.****WIRELESS TELEGRAPHY ORDINANCE, 1924.****A** *An Ordinance to regulate Wireless Telegraphy, Visual and Sound Signalling and similar methods of communication in Palestine.*

BE IT ENACTED BY THE HIGH COMMISSIONER FOR PALESTINE, WITH THE ADVICE OF THE ADVISORY COUNCIL THEREOF:—

1. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1924.

2. The expression "wireless telegraphy" means any system of communication by means of any apparatus for transmitting messages or other communications by means of electric signals without the aid of any wire connecting the points from and at which the messages or other communications are sent or received.

3. (1) A person shall not establish or maintain any wireless telegraph station, or install or work or maintain any apparatus for wireless telegraphy, in any place in Palestine or on board any ship or aircraft registered in Palestine, except under and in accordance with a licence granted in that behalf by the High Commissioner.

(2) Every such licence shall be in such form and for such period as the High Commissioner may determine, and shall contain the terms, conditions, and restrictions on and subject to which the licence is granted.

(3) Where an applicant for a licence proves to the satisfaction of the High Commissioner that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted, subject to such special terms, conditions, and restrictions as the High Commissioner may think proper.

(4) If any person establishes a wireless telegraph station without a licence, or installs or works any apparatus for wireless telegraphy without a licence, he shall be liable, on conviction by a District Court, to a penalty not exceeding £E. 200 or to imprisonment not exceeding six months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence; but no proceedings shall be taken against any person under this Ordinance except by order of the Attorney General.

(5) Notwithstanding anything in the preceding sub-section, if a magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established or maintained without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked or maintained in any place or on any ship or aircraft within his jurisdiction without a licence, or contrary to the provisions of any Regulations made under this Ordinance, he may grant a search warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship or aircraft, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

4. (1) The Postmaster-General may make regulations with the approval of the High Commissioner.

(a) prescribing the form and manner in which applications for licences under this Ordinance are to be made and the fees payable on the grant or renewal of any such licence;

(b) requiring any operators or other persons engaged in the working of wireless telegraphy to be provided with certificates and making provision as to the manner and the conditions of the issue and renewal of any such certificate, including examination and tests to be undergone.

(c) as to the working of any apparatus for wireless telegraphy installed in ships and aircraft not registered in Palestine while such ships are in the territorial waters of Palestine, and such aircraft are upon or over the territory or the territorial waters of Palestine;

(d) for giving effect to the provisions of any international convention to which the Government of Palestine has acceded and any regulation made thereunder so far as the same relate to wireless telegraphy.

(2) Any person acting in contravention of, or failing to comply with, a regulation made under this Section, shall be liable to imprisonment for a term not exceeding six months or a fine not exceeding £E. 50 or both penalties, and in the case of continued offence, a further fine not exceeding £E. 5 for each day during which the offence continued. He shall further be liable to forfeit any apparatus for wireless telegraphy in respect of which the offence is committed.

5. (1) Any person who sends by wireless telegraphy a message or communication of which the publication would be an offence under any Article of the Penal Code or of any law or Ordinance if it were made by means of the press or at a public meeting, shall be liable to the penalties prescribed in such Article.

(2) Any person who

(a) sends or attempts to send by wireless telegraphy a message or communication of an indecent, obscene, or offensive character, or a message or communication subversive to public order or calculated to disturb the public peace; or

(b) sends or attempts to send by wireless telegraphy a signal of distress of a false or misleading character or a false or misleading message as to a vessel in distress; or

(c) improperly divulges the purport of any message sent or proposed to be sent by wireless telegraphy; shall be liable, on conviction by a Magistrate, to a fine not exceeding £E. 50 or to imprisonment for a term not exceeding six months or to both penalties.

(3) Any person convicted of an offence under this Section shall further be liable to forfeit any licence granted under this Ordinance and any apparatus by means of which the offence was committed.

6. The provisions of this Ordinance shall apply to any visual or sound signalling station used or intended to be used for the purpose of communication with ships at sea as they apply to wireless telegraphy stations, but, subject to the provisions of Section 7, shall not apply to such stations on board a ship or aircraft. For the purpose of this Section, visual or sound signalling station includes any permanent or fixed apparatus for the purpose of visual or sound signalling.

The provisions of this Ordinance shall apply likewise to the installation and working of apparatus for utilising etheric waves for the purpose of transmission of energy without the aid of any wire connecting the points from and at which the energy is sent and received as they apply to

the installation and working of apparatus for wireless telegraphy.

7. If at any time in the opinion of the High Commissioner an emergency has arisen in which it is expedient that the Government of Palestine should have control over the transmission of messages by wireless telegraphy or visual or sound signalling or the utilisation of etheric waves for the transmission of energy, it shall be lawful for the Postmaster-General, with the approval of the High Commissioner, to take possession forthwith of any apparatus for any such purposes, and, during the continuance of the emergency, to make such further rules as appear necessary with respect to the possession, sale, purchase, construction and use of apparatus for any such purpose or component parts of such apparatus.

The contravention of any such regulation shall be subject to the same penalties as the contravention of a regulation made under Section 4 of this Ordinance.

8. The Ottoman Law dated 6th of August, 1330, concerning wireless telegraphy shall cease to have effect in Palestine.

PROVISIONAL LICENCE TO ESTABLISH B A WIRELESS RECEIVING STATION.

.....
of
is hereby authorised (subject in all respects to the provisions of the Wireless Telegraphy Ordinance, 1924, and to the conditions set out on the back hereof) to establish a Wireless Station for the purpose of receiving messages at for a period ending on the last day of the month of 192....

Dated.....day of.....192....

Issued on behalf of the

High Commissioner.....

Postmaster-General.

Signature of Licensee.....

If it is desired to continue to maintain the station after the date of expiration, a fresh licence must be taken out within fourteen days.

CONDITIONS.

1. The Licensee shall not allow the station to be used for any purpose other than that of receiving messages.

2. The station shall not be used in such a manner as to cause interference with the working of other stations. In particular, reaction must not be used to such extent as to energise any neighbouring aerial. The station shall also be subject to such restrictions as to wavelength as may from time to time be imposed by the Postmaster-General.

3. The combined height and length of the external aerial (where one is employed) shall not exceed 30.5 metres. An aerial which crosses above or is liable to fall upon or be blown on to any overhead wire (including electric lighting and tramway wires) or is capable of producing a contact between an overhead power wire and the Postmaster-General's telegraphs must be guarded to the reasonable satisfaction of the Postmaster-General and the owner of the power wire concerned.

4. The Licensee shall not divulge or allow to be divulged to any person (other than a duly authorised officer of the Palestine Government or a competent legal tribunal) or make any use whatsoever of any message received by means of the station other than time signals, musical performances and messages transmitted for general reception.

5. The station shall be open to inspection at all reasonable times by duly authorised officers of the Post Office who will produce their cards of identity on request.

6. The Licence may be cancelled by the Postmaster-General at any time either by specific notice in writing sent by post to the Licensee at the address shown hereon, or by means of a general notice in the Official Gazette addressed to all holders of wireless receiving licences for broadcast messages, and will be cancelled on breach of any of the foregoing conditions. In the event of cancellation the decision as to whether any part of the fee shall be returned will rest with the Postmaster-General.

N.B.—Any change of address must be promptly communicated to the Postmaster-General.

PARAGUAY

(See Maps 49, 51, 52 and 53.)

THE Republic of Paraguay is divided into two distinct portions by the river bearing the same name. The present constitution was proclaimed on the 25th November, 1870. The legislative authority is vested in a Congress of two houses, the executive being entrusted to a President, assisted by five ministers.

CONTROL.

There are three wireless stations in Paraguay at present open to the public, their control being vested in the Director of Posts and Telegraphs. These stations are situated at Asuncion, the capital of the Republic (or—more strictly—Lambaré, on the outskirts thereof), Concepcion, and Encarnacion. They are identical in capacity and possess a radius of 300 miles by day and 600 miles by night.

There are no privately owned stations. The Government has instituted a wireless telegraph school which is attached to the college of Ministry and Naval Cadets.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Belisario Rivarola ..	Minister of Interior	Avenida Colombia, Asuncion
José del R. Ayala ..	Director-General of Posts and Telegraphs	Calle Yegros, Esq. Bermejo, Asuncion
Sebastian Cavina ..	Head of Telegraph Office	431, Calle Oliva, Asuncion

ORGANISATION.

The Paraguayan wireless service is at present confined to the interior of the country, for the Governments of Paraguay and Argentina have not yet been able to come to a working agreement for the maintenance of a public service. An agreement, however, has been entered into by the two Governments to use wireless as an auxiliary to relieve congestion or breakdown of the line system.

The three Government installations are not confined to a specific Government service, but are available for the public service within the country and occasionally, on emergency, for communication with the exterior.

ADMINISTRATION.

There are no special laws or regulations affecting the subject, but the text of the Convention referred to above will be found below.

A—Convention between Paraguay and Argentina.

CONVENTION.

A The following is the text of a Convention entered into between the Governments of Paraguay and the Argentine Republic.

Date of the Convention,
November 15th, 1918.

Plenipotentiaries—

For Paraguay: Dr. Eusebio Ayala.

For Argentina: Dr. José María Cantillo.

After an interchange of credentials, which were found in order, the following agreement was signed, the object of which is to facilitate communication between the two countries mentioned.

1. For the telegraphic interchange between Argentina and Paraguay radiotelegraphic methods will be used as an auxiliary whenever—owing to the amount of traffic or breakdowns in the terrestrial lines—it may become necessary to use wireless in order to maintain an uninterrupted service.

2. Both the Argentina and the Paraguay offices will use for the exchange of messages the Posadas and Formosa stations, one at a time, or the two if necessary. The two manage-

ments will see to it that the traffic is distributed in such a way as to ensure the quickest service between the hours between 12 noon and 12 midnight, Argentine time. The wavelengths will be of the standard damped type of 600 metres.

3. Whenever it is required, and should it be impossible to carry through the exchange over the stations named in the preceding article, the service may be taken off directly between Buenos Aires and Asuncion.

4. In all matters referring to transmission rates, accounts and service regulations, the Argentine and Paraguay regulations at present in force in the telegraphic service will apply.

5. This convention will come into effect thirty days after its ratification by the contracting parties, and either party may withdraw at any time by giving 90 days' notice previous to the date when the suspension of the service is intended to take effect.

This convention is made out in duplicate and signed by the two plenipotentiaries whose seals have been affixed, and they have agreed that the exchange of the ratification will take place in the city of Asuncion within thirty days from this date.

PERSIAN GULF

(See Maps 3, 16 and 21)

Including : Oman, Bahrein Islands, Aden, Perim, Sokotra, and the Kuria Murai Islands.

OMAN is an independent State in South-Eastern Arabia, whose integrity has been guaranteed by Great Britain and France. Sultan Seygid Taimur bin Feysil is the reigning head.

Aden is an important coaling station for ships voyaging to and from the East.

CONTROL AND ORGANISATION.

The stations are under the control of the Indo-European Telegraph Department of the Government of India.

ADMINISTRATION.

There are no local laws or regulations applying to wireless telegraphy in the Persian Gulf.

PERU

(See Maps 49, 50 and 52)

CONTROL.

THE control of radiotelegraphy is directed by the Minister of the Interior.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Sir W. F. Ford ..	Administrator-General Posts and Telegraphs ..	Lima
Mr. R. Ricci ..	Superintendent of the Radiotelegraph Service ..	Desamparados 187 (Lima), Central Office

By virtue of an agreement with the Peruvian Government, Marconi's Wireless Telegraph Company, Ltd., on May 1st, 1921, took over the administration of the Postal, Telegraph and Radiotelegraphic Services of the Republic and will operate them for a period of twenty-five years.

The concession includes the sole and exclusive operation of all national and international wireless telegraph stations within the Republic and the exclusive right to erect any further wireless stations that may be necessary.

In accordance with the terms of the above agreement, a programme of reconstruction and reorganisation of the radio service is being carried out.

Fifteen stations are now open for public service of which three are of medium power (15 kw.) and two are equipped with Radiotelephonic apparatus. Several new stations are contemplated, including a high-power station for international correspondence, and one at present under construction at Piura.

There are at present no weather, meteorological, hydrographic or press services. A time signal service is in operation in Lima, at 1 p.m. daily, seventy-fifth meridian time, a time-ball is dropped from the mast of San Cristobal wireless station in accordance with the wireless signal received from the U.S. Naval station at Darien (Canal Zone). There are no direction finding stations.

ADMINISTRATION

The following rules and regulations are at present in Peru:—

A—Decree dated January 14th, 1921.

B—Decree dated May 15th, 1922.

C—Law No. 2263 concerning Ship Stations.

DECREE DATED JANUARY 14TH, 1921.

A Considering:—

1. That, according to the laws of the Republic, the national services of posts and telegraphs and other similar services form a monopoly, the exploitation of which is in the hands of the State;

2. That the modern system of wireless telegraphy and telephony should, owing to their nature, be included in the said monopoly because they give the same services as the ordinary electric telegraphy, the only difference between the two being the means of transmission; and,

3. That the recent war of nations has shown the necessity that Governments should supervise the telegraphic installations of whatever kind

they may be, under their respective jurisdictions, this being the only way to avoid clandestine communications which might compromise the neutrality of the nation and endanger its sovereignty.

It is decreed:—

Art. 1. Only the State may exploit, within the territory of the Republic, the systems of telegraphy and telephony known by the names of "wireless telegraphy and telephony" and "radiotelegraphy and radiotelephony."

Art. 2.—The Executive Power only will be able to concede specially limited permission for the establishment of small wireless telegraph and telephone stations for scientific training, experiments or local service, it being understood that these offices will always be subject to official inspection, supervision and regulation.

ART. 3.—On the denouncement and verification of any clandestine installations by the departmental authorities, the Ministry of Government is authorised to proceed to the immediate destruction of the same without any right of claim on the part of the interested parties.

DECREE DATED MAY 15TH, 1922.

B It being necessary to regulate the concession of authorisations for the installation and use of small radiotelegraphic or radiotelephonic stations, intended for instructional purposes, scientific experiment, or given determined local services; in conformity with Art. 2 of the Supreme Decree of the 14th January, 1921, it is resolved that, when the Government grants a licence for the installation of small radiotelegraphic or radiotelephonic stations, it will be made under the following conditions:—

1. Every transmitting station must be equipped with a receiving apparatus.

2. Applicants must produce proofs of their nationality and two references written by persons of Peruvian nationality who are not relatives.

3. The installation must be approved by the Administrator-General of the Radiotelegraphic Service.

4. Absolute secrecy must be kept of all correspondence received by means of the apparatus.

5. The applicants must show to the Administrator of the Service that the station is desired for scientific purposes or for public utility. If they contemplate scientific investigation they must present certificates from some Government department or some recognised scientific body that they are competent investigators.

6. Every transmitting station must be under the control of a person holding a certificate of competency from the Administrator-General of the Service, or possessing—

(a) Sufficient knowledge for the regulation and control of the apparatus with which it is desired to work.

(b) A knowledge of the regulations of the International Convention, not only as regards the prevention of interference, but also as regards the duties imposed upon operators.

(c) Prove a speed in the transmission and reception of not less than twelve words per minute (Morse code).

When it is necessary to examine an applicant in the qualifications referred to a fee of \$5.00 will be charged.

Should the licensee not possess the required qualifications he may, under exceptional circum-

stances, be allowed to employ a qualified operator to work the transmitting and receiving apparatus.

7. It has been decided to charge small fees to cover staff and inspection expenses. For every station with power not exceeding 10 watts \$10.00 will be charged as initial fee, plus an annual fee of \$20.00. In total, \$30.00 for the first year and \$20.00 for each succeeding year. These fees cover both installations—transmitting and receiving. For more powerful installations higher fees will be charged.

8. Transmission will only be permitted to specified and duly authorised stations, and in any case the number of these must not exceed five. Written authorisations must be obtained from the proprietors of the stations with which communication is to be made.

AERIALS.

The height and maximum dimensions of these must be as follows:

Maximum height of aerial above ground, 100 feet.

Total length of wire, including lead-in wire, 100 feet for single wire aerials, and 140 feet where two or more wires are used, e.g., total length of double wire, 70 feet.

9. *Portable Installations.*—The general conditions are the same as for fixed stations. The power of these stations is limited generally to 10 watts, and their use will ordinarily be permitted within a radius of 10 miles from a fixed point.

LAW No. 2263.

C ART. 1.—Steamers of one thousand five hundred tons displacement or over, engaged especially in the transport of passengers, that touch in ports of the Republic, must be equipped with radiotelegraphic installations with a transmitting range of at least 300 miles, and a competent staff to attend to the service of wireless communication with every class of ship and with the stations established, or in future to be established on our coast. These installations must meet with the satisfaction of the inspecting engineer appointed by the Executive Power.

ART. 2.—A limit of six months, counted from the promulgation of this law is fixed for the steamship companies in the Pacific to comply with the obligation imposed in Article 1, under the penalty of their steamers not being admitted to any of the ports of the Republic.

ART. 3.—The present law relates to companies having permanent service established in the Republic.

PHILIPPINE ISLANDS

(See Maps 22 and 23.)

THE Philippine Islands belong to the United States of America, but the country has a representative and practically autonomous government. The members of the Senate and House of Representatives are all Filipinos elected by popular vote.

ORGANISATION AND CONTROL OF WIRELESS STATIONS.

There are twenty-nine land stations owned and operated by the Insular Government, all of which are open for general public service. One of these stations, Zamboanga, in the Island of Mindanao, works with the British North Borneo Government station at Sandakan.

The entire radio system, except a few stations of the United States Army and Navy, are controlled by the Government of the Philippine Islands and form a part of the telegraph cable and postal system of the Insular Government. The station at Cavite operated by the United States Army and Navy is also open to ship and foreign traffic, and transmits time and weather signals.

The stations of the Philippine Government are designed primarily for commercial business. Those at Batangas, Iloilo, Cebu and Malabang serve as an auxiliary to the telegraph and cable system.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Hon. Cipriano E. Unson	Actg. Sec. Dept. of Commerce and Communication ..	Manila
Mr. José Topacio ..	Dir. of Bureau of Posts	Manila

ADMINISTRATION.

The radio laws and regulations of the United States are in force as far as local conditions permit.

A bill is being passed by the Philippine Legislation giving authority to the Director of Posts, under the general supervision of the Secretary of Commerce and Communications, to regulate the establishment and operation of wireless stations in the Philippine Islands and on vessels registered therein.

POLAND

(See Maps 3 and 8)

CONTROL.

THE control and administration of wireless telegraphy in the Republic of Poland is under the Director-General of Posts and Telegraphs.

STATIONS.

There are now four transmitting stations in operation at Posen, Warsaw, Cracow and Grudziadz, and further stations for internal communications are under construction or projected.

ADMINISTRATION.

The first diet of the Republic of Poland passed a statute in May, 1919, under which radiotelegraphy and telephony was made a Government monopoly. The development of radiotelegraphy has necessitated the addition of new clauses to this statute which authorises the Ministry of Posts and Telegraphs to grant licences for the construction, ownership and use of commercial wireless stations, and for broadcasting and private stations.

PORTUGAL

(See also Maps 2, 10, 24 and 33.)

Including: Cape Verde Islands, St. Thomé and Príncipe, Azores.

ON October 5th, 1910, the Republic was proclaimed, and on August 20th, 1911, the present constitution was established. Affairs are administered by a President, the two Chambers reserving to themselves the legislative functions.

CONTROL.

The radiotelegraphic service in Portugal is a state monopoly. No private individual is allowed to erect or work wireless, and may not even own a simple receiver. The only exception made is that in favour of shipping companies, which are allowed to have wireless stations on board their vessels.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Pilinio da Silva ..	Minister of Commerce	Lisbon
Antonio Maria da Silva ..	Postmaster-General	Lisbon
Helder Ribeiro ..	Minister of War	Lisbon
Delfim Miranda Monteiro ..	Inspector of Telegraphic Military Service	Lisbon
Carlos de Vasconcellos ..	Minister of Colonies	Lisbon
João Domingos dos Santos ..	Minister of Navy	Lisbon
Ayres Ferreira de Sousa ..	President of the Technical Committee of Torpedos and Electricity	Lisbon
Alvaro de Melo Machado ..	Director of the Wireless Telegraphic Services of the Navy	Lisbon

ADMINISTRATION.

The current laws and regulations reprinted below comprise :—

A—Act of July 15th, 1913.

B—Regulations.

C—Decree of April 18th, 1916.

D—Decree of March 29th, 1917.

THE ACT OF JULY 15TH, 1915.

A 1. On the expiration of a period of three months from the approval of the Regulations for the execution of the present law, no Portuguese steam vessel, with accommodation for more than fifty passengers (including crew), shall be permitted to sail from any port without having installed a wireless telegraph apparatus of the system which suits it best, in good working order, and capable of despatching and receiving radiotelegrams within a radius of action which must never be less than 100 miles.

(a) From this provision those steamers are excepted which navigate only between ports situated at distances of less than 200 miles,

(b) For steam vessels, which navigate in the Colonies where there are coastal radiotelegraph stations, and which only occasionally come to the Metropolis, the period granted for the installation of wireless telegraphy, to which the present article refers, shall be six months.

2. The wireless telegraph material of a vessel, and the respective service of transmission and reception of radiotelegrams, shall be under the charge of one or more duly qualified telegraphists.

§ The number of telegraphists, their qualifications, and that of the indispensable auxiliary staff, the organisation of their technical instruction, provisions with respect to the service of supervision, conditions of the installation of the apparatus, and the official verification of their working shall be determined pursuant to the Regulation drawn up for the execution of the present law.

3. It is the province of the captain of the vessel to give instructions and orders for the complete carrying out of the laws and regulations in force with respect to the radiotelegraphic service, and he shall exercise the necessary supervision, carrying out and causing to be carried out any provisions which he may consider advantageous for the good working of the said service.

4. The captain shall be held responsible for any negligence in complying with the requirements of Article 1, and on conviction he shall be liable to a fine not exceeding Rs. 200 and the suspension of his master's certificate for one year.

5. Negligence or failure on the part of the captain to carry out the provisions of Article 3

shall render him liable to a fine not exceeding Rs. 50, which may be accompanied with imprisonment not exceeding one month after the first offence.

6. If there should be a disaster, stranding or loss of the vessel, resulting from the lack of vigilance of the telegraph staff, and the said fault was due to the negligence of the captain in failing to carry out and causing to be carried out the provisions in force relating to the radiotelegraph service, the captain shall be liable to a fine not exceeding Rs. 200, accompanied or not, according to the gravity of the offence with suspension of his certificate for a period of from one to five years.

If the serious injury, or the death, of one or more persons should result from the disaster, the penalties applicable shall be respectively those laid down in Articles 368 and 369 of the Penal Code.

7. The offences referred to in Articles 4, 5 and 6 constitute maritime crimes, and shall be judged by the Commercial Maritime Tribunal pursuant to the disciplinary Code of the Mercantile Marine.

8. All the wireless apparatus intended for Portuguese vessels shall be exempt from Customs and Municipal Duty.

9. Any legislation contrary hereto is hereby repealed.

REGULATIONS.

B The following regulations were issued on August 29th, 1913 :—

1. Ships may be equipped with any wireless telegraph apparatus which is in keeping with scientific progress.

2. The shipping or any other company may establish and work a wireless telegraph station on board ship. The station must possess a licence granted by the Government of the nationality to which the ship belongs. The "class" of the station is mentioned in the licence.

3. There are three classes :—

(a) Long voyage passenger steamers with accommodation for more than 150 passengers must maintain continuous service.

(b) The same type of steamer with accommodation for less than 150 passengers must maintain continuous receiving service, whereas the transmission may be limited.

(c) Cargo or fishing boats, or vessels carrying more than 50 persons (including crew), may have limited service.

4. and 5. Wavelength of 300 m., 600 m., and more than 1,800 m. may be employed. Small boats may work on a 300 m. wave when sending, but 600 when receiving. The waves must be as pure and as undamped as possible.

The oscillator must not be directly connected to the antennæ, except in case of distress, or on certain small steamers where the energy employed in the primary does not exceed 50 watts.

6. The cabin must be divided into two parts so that the transmitting gear and the spark gap may be separated from the receiving apparatus. Double walls must be used to isolate the interior from the exterior.

7. The instruments must be able to receive and send 100 letters per minute.

8. New installations employing a power of more than 50 watts must possess such arrangements as will enable them to have a range inferior to their normal, the smallest being approximately 15 miles. All old stations must be brought to this standard as soon as possible.

9. The receiving instruments must be able to tune for waves up to 600 m., being highly protected against disturbances.

10. The power measured at the terminals of the generator must not exceed 1 kW. in normal circumstances. An increase is allowed when a station desires to communicate with a land station other than the nearest, at a distance of more than 200 miles from the nearest land station, and when, in exceptional circumstances, the communication cannot be effected with 1 kW.

11. First and second-class steamers must carry an emergency set in as safe a place as is possible. The emergency set must be able to work for six hours at least at a distance of 80 miles for first class, and 50 miles for second-class steamers.

12. The apparatus must be operated by a telegraphist who possesses a certificate from the Portuguese Government, or, in urgent cases and for one trip only, from any other Government which has signed the International Convention :

13. There are two certificates :—

(a) 1st Class (same as International).

(b) 2nd Class (12 words, adjustment of apparatus, knowledge of each instrument and its work, and rules *re* handling of telegrams).

Service.—Any member of the crew able to assist the telegraphist in his work, and possessing a knowledge of the operation of the apparatus, may be an "auxiliary" operator.

14. Second-class telegraphists may be employed on board where the wireless service is only for the shipping company's requirements or on fishing vessels, or they may act as assistants in cases where there is already one first-class operator. On first-class steamers two first-class telegraphists must be employed.

15. On second-class steamers, one first-class and one second-class telegraphist should be employed ; on third-class vessels one second-class telegraphist will suffice.

Service.—As long as land stations do not exist in the Portuguese Colonies, Portuguese steamers plying there are allowed to carry one first-class telegraphist and one "auxiliary."

16. Transmitting must be performed by a first or a second-class telegraphist, except in urgent cases.

17. The certificates state that the telegraphist has taken an oath of secrecy with regard to the correspondence.

18. The captain has authority over the working of the station.

19. Portuguese operators are preferred.

20. Should none be obtainable, foreigners may be employed if they are in possession of the Portuguese Government's certificate.

In urgent cases where no certificated telegraphist is available, provisional certificates may be issued for one voyage.

21. Certificates are supplied by the Commission after the examination of the telegraphist.

22 and 23. Captains are also bound by an oath of secrecy.

32. All telegrams sent and received on board must be registered by the captain on forms supplied by the Government. The date and hour of the sending or reception of these telegrams must be indicated.

33. Only the telegraphists and the captain are allowed to enter the wireless cabin.

34. The wireless room and the bridge must be connected by either a speaking tube or a telephone, unless they are within easy distance of one another.

DECREE OF APRIL 8TH, 1916.

C This decree forbids the installation of either wireless transmitting or receiving stations, but Government can authorise the setting up of receiving stations only.

These said stations, when authorised by Government, are subject to its control, and whenever Government may judge convenient, it may withdraw the same authorisations without any indemnification.

The owners of these stations have to pay in advance the tax of Escudos \$5.50 per annum.

Anyone who sells wireless material is obliged to send to the Government a statement of the material sold, with the names of the persons who have purchased it to identify them. Those who do not fulfil this identification will pay the fine of Escudos \$20.00 to \$100.00, and all the material that he has for sale will be seized by the Government, and will belong to the Government. In case of a second offence he will be prosecuted.

The owner of any receiving station, or any person who may have made use of the same station, and who divulges contents of messages that have been received by such station incurs a penalty.

In case of a second offence he is subject to imprisonment for six months to a year, and a fine.

DECREE OF MARCH 29TH, 1917.

D In consideration of the highest interest of the State, it is undesirable in the existing circumstances that private persons should possess wireless apparatus of any kind, or make use of the same apparatus.

It has been decided that it is desirable to confine the employment of such apparatus to schools of observatories, so as to limit the risk of misuse ; and availing ourselves of the authorisation granted by the Executive Power by the Laws Nos. 373 and 491 of September 2nd, 1915, and March 12th, 1916.

We decree by the proposal of the Minister of Works and Social Providence, the following :—

ART. 1.—It is expressly forbidden to private persons to possess or make use of wireless apparatus and fittings, or to import or sell to the public the said apparatus and accessories.

ART. 2.—The owners—whatever they may claim to be its purpose—of apparatus and wireless accessories without conducting wires, will

have to deliver the said articles for deposit against receipt; in Lisbon, at the warehouses of the Material of the Posts and Telegraphs; in Oporto, at the Secretary's Office of the Second Electric Circumspection; and in the other capitals of the administrative districts of the continent and adjacent islands, at the Secretary's Offices of the Electric Sections and Sub-sections of of the Post and Telegraph Service.

The deliveries in deposit to which this article refers will have to be effected for the Continent of the Republic, in the maximum period of five days from the date when this Decree is published in the "Diário do Governos"; for the adjacent islands in the same period reckoned from the date when the same daily paper reaches there.

ART. 3.—The apparatus and wireless fittings without conducting wire that are in the Government Teaching Institutions, and at the Astronomical and Meteorological Observatories, in the first case for the purpose of demonstration, and in the second case for scientific tests, are to be under the safe keeping of the directors of the same institutions and observatories, and will be used only for those

purposes and in the presence of the said directors and under their entire responsibility, in the presence of the respective teachers and observers.

ART. 4.—He who transgresses the stipulations of this Decree incurs a penalty of Escudos \$20.00 to \$100.00, which will be fixed and collected by the Administration of Posts and Telegraphs; when it is paid voluntarily, the same Administration will order all the material to be seized, which will then belong to the Government.

In case of a second offence the fine will be fixed at its maximum.

If the fine is not paid voluntarily, the transgressors will be handed over to the judiciary, in order to be judged and the penalty imposed by the correctional police.

In Lisbon and Oporto the jurisdiction will concern the tribunal of transgressions.

ART. 5.—This Decree will come into force immediately, and will be valid to the end of the European War, after which the apparatus and wireless fittings which were voluntarily delivered will be returned to their owners, against receipt as to the conditions of Article 2.

ART. 6.—All legislation to the contrary is hereby revoked.

PORTUGUESE EAST AFRICA

(See Maps 25, 31 and 32.)

PORTUGUESE East Africa comprises three distinct territories:—

(a) The Province of Mozambique, directly administered by the Portuguese Government.

(b) The Companhia de Moçambique, a chartered company with Sovereign rights subject to the control of the Government in matters relating to the Portuguese Sovereignty, international and judicial rights, agreements and conventions.

(c) The Companhia do Niassa, with a similar Royal Charter.

CONTROL AND ORGANISATION.

The Wireless service is a State monopoly under the control of the Repartição Superior dos Correios e Telegrafos of the Province of Mozambique. The existing stations are of low power, that at Lourenço Marques being only 2-kW., but the projected scheme includes a 25-kW. station in that district, for inter-colonial service, two 15-kW. stations which are being built at Tete and Mozambique, four 1½-kW. stations at Lourenço Marques, Inhambane, Quelimane and Mopeia, and smaller stations at Vila Nova de Gaza, Chinde and Angóche.

ADMINISTRATION.

Wireless Telegraphy is administered under the Decrees of 21st January, 1910, and 26th November, 1916, issued by the Portuguese Government for the control of all their Colonies. The Laws and Regulations governing the administration are similar to those in force in Portugal.

RHODESIA.

(See Maps 25, 31 and 32.)

NORTHERN RHODESIA is administered (under the Colonial Office) by a Governor and Commander-in-Chief assisted by an Executive Council and a Legislative Council.

The Hon. H. A. Baldock, M.B.E., M.L.C., is Postmaster-General at Livingstone.

There are no existing or projected stations, but radiotelegraphy in Northern Rhodesia would be administered under the following :—

A—Government Notice No. 84 of 1923.

B—Licence for Wireless Installation.

ADMINISTRATION OF NORTHERN RHODESIA.

A GOVERNMENT NOTICE No. 84
OF 1923.

It is hereby notified for public information that under and by virtue of the powers conferred upon him by sub-section *three* of section *thirteen* of "The Northern Rhodesia Telegraphs Proclamation, 1914" His Honour the Administrator has been pleased to prescribe the following terms and conditions upon which licences to import, keep, use or establish any apparatus or installation for transmission of messages by wireless telegraphy will, if at all, be granted.

By command of His Honour the Administrator
Richard Goode,
Secretary.

Livingstone

5th July, 1923.

1. No licence shall be issued except under the authority of the Administrator and on payment of an annual fee of one pound sterling (£1).

2. Applications for licences must be addressed to the Comptroller of Posts and Telegraphs, and must contain the following information.

(a) The full name and occupation of the applicant.

(b) The address at which the apparatus is proposed to be installed.

(c) A full description of the apparatus, with such diagrams as may be required.

(d) The purpose for which the apparatus is proposed to be used : and

(e) General such other information as may be required by the Comptroller of Posts and Telegraphs.

3. An applicant may further be required—

(a) To produce evidence of British birth or nationality.

(b) To furnish two approved written references as to character ;

(c) To satisfy the Comptroller of Posts and Telegraphs by examination or otherwise that he has attained a knowledge of the regulations of the International Radiotelegraphic Convention in so far as they relate to the prevention of interference and impose certain duties on all wireless operators, and that he can read by sound Morse signals at the rate of twelve words per minute ; and

(d) To satisfy the Comptroller of Posts and Telegraphs that he has in view some definite object of scientific value or general public utility.

4. Each licence issued under these regulations shall contain a schedule setting forth—

(a) The maximum power which may be used ;

(b) The maximum wavelength ;

(c) The maximum dimensions of the aerial ;

(d) The stations (if any) with which communication may be established ; and

(e) Such other details as may be required ;

and the licensee shall not at any time exceed or vary the limits or conditions therein laid down, except with the consent in writing of the Comptroller of Posts and Telegraphs.

5. The granting of any licence under these regulations shall not in any way vary or detract from the rights, powers or privileges of the Comptroller of Posts and Telegraphs as defined

by law or regulation, nor shall it involve any obligation or responsibility on the Comptroller of Posts and Telegraphs for any matter or thing which may be done by the licensee or his agents.

6. All apparatus and plant installed under licence shall be subject to the approval of the Comptroller of Posts and Telegraphs, and to inspection by any of his officers duly authorised thereto from time to time.

7. The licensee shall comply with all directions which shall be given to him by the Comptroller of Posts and Telegraphs, and shall at any time cease to work or shall completely dismantle the licensed apparatus and plant upon notice to do so in writing from the Comptroller of Posts and Telegraphs.

8. The licensee shall not divulge to any unauthorised person or make any use whatever of any message coming to his knowledge by means of his apparatus and not intended for his use.

9. The licensee shall account to the Comptroller of Posts and Telegraphs for any rates or fees that may be chargeable on any message passing through his apparatus.

10. Except with the consent in writing of the Comptroller of Posts and Telegraphs, the licensee shall not permit the use of his apparatus by any other person, nor shall he assign or dispose of any rights, powers or privileges granted to him by licence.

11. The Comptroller of Posts and Telegraphs may at any time give notice in writing to determine any licence granted under these regulations.

DEPARTMENT OF POSTS AND
TELEGRAPHS,
NORTHERN RHODESIA.

B

LICENCE TO IMPORT, KEEP AND ESTABLISH AND
WORK A PRIVATE WIRELESS APPARATUS.

Under the powers conveyed by section *thirteen* of "The Northern Rhodesia Telegraphs Proclamation, 1914" and Government Notices No. 84 of 1923 a licence is hereby issued to

to import, keep, establish and work apparatus or installation for transmission of messages by wireless telegraphy at

provided such apparatus shall be of the character specified in the schedule hereto.

The licensee agrees to abide by the regulations regarding the working of wireless installations as published by Government Notice No. 84 above referred to and to carry out any of the requirements of the Comptroller of Posts and Telegraphs as therein laid down.

General Post Office, Livingstone.

.....192..

Postmaster-General.

.....
Licence.
.....Place.
.....Date.

Regd. No.

SCHEDULE
to licence granted to
to establish and work apparatus for transmission of wireless signals.
(a) Maximum power;
(b) Maximum wavelength;
(c) Maximum dimensions of aerial:
1. Maximum height above ground;

2. Total length of aerial, including leading-in wires
(d) Stations with which communication may be established:
Postmaster-General,
General Post Office, Livingstone,
.....19.....

SOUTHERN RHODESIA

Southern Rhodesia is now a self-governing Colony under a Governor appointed by the Crown.

Wireless telegraphy is under the control of the Postmaster-General who is also Director of Signals in the Defence Force. A $\frac{3}{4}$ kW. valve set has recently been erected at the Drill Hall, Salisbury, for defence purposes and is used for communicating with outside stations both by telegraphy and telephony. A similar set is in operation at Bulawayo. Some seventy licences have been issued for private installations which are situated at various parts of the colony.

OFFICERS CONTROLLING WIRELESS

Official.	Title.	Address.
Mr. A. E. Holloway	Postmaster-General	G.P.O., Salisbury
Mr. E. G. Ade	Secretary to Post Office	G.P.O., Salisbury
Mr. T. R. Jephcott	Inspector	G.P.O., Salisbury

It is proposed to erect at Salisbury a wireless telegraph station sufficiently powerful to communicate with Pretoria and it is expected that this station will be in operation in the early part of 1925. It will be used for both Government and Commercial purposes.

No permanent arrangements have yet been made for the transmission of time and weather and meteorological signals.

ADMINISTRATION.

Southern Rhodesia regulates radiotelegraphy within its border by the "Electric Telegraph Amendment Ordinance" of 1904, and sundry Notices of 1912 and 1922, the text of which will be found below.

A—Electric Telegraph Amendment Ordinance, 1904.

B—Postal Notice No. 55 of 1912.

C—Government Notice No. 391 of 1912.

D—Government Notice No. 278 of 1922, regarding the Issue of Licences.

E—Form of Licence for Telephone Stations.

TELEGRAPH (AMENDMENT) ORDINANCE.

A The term "electric telegraph" whenever used in the "Electric Telegraph Act, 1861," or any law amending the same or relating to "electric telegraphs," shall be interpreted as including any system or means of conveying signs, signals, or communications by electricity, magnetism, electro-magnetism, or other like agency, and whether with or without the aid of wires, and including the system commonly known as wireless telegraphy, or ætheric signalling, and any improvements or developments of such system; and the term "line of electric telegraph" shall be interpreted as including any apparatus, instrument, mast, standard, wire, substance, matter, or thing whatever, which is, or may be, used for the purpose of sending,

transmitting, conveying, or receiving such signs, signals, or communications.

2. The meaning of the term "person" shall be further extended so as to include individuals, partnerships, companies, and corporations.

3. The provision of the first section of the said Act as to its application to Southern Rhodesia shall be read and construed as including the territorial waters thereof.

4. Within Southern Rhodesia or the territorial waters thereof, no person not thereto expressly authorised by some law shall erect or make use of any mast, standard, or apparatus of any kind, for the purpose of signalling without wires by means of electricity, magnetism, electro-magnetism, or other like agency, or shall erect or construct any line of electric telegraph, except under a licence to be granted by the Administrator.

5. The Administrator may authorise the issue of a licence for the establishment or use of any apparatus or installation for the transmission of signs, signals, or communications, by electric telegraph, with or without the aid of wires, and may revoke the same at any time, and there shall be payable annually in respect of such a licence such sum not exceeding One Hundred Pounds sterling, as may be fixed by regulation.

6. The terms and conditions of such licence, and the duration thereof, shall be subject to such regulations as may from time to time be made by the Administrator.

7. Any person who shall establish or use, or attempt to establish or use, any such apparatus or installation as is mentioned in Sections 1 and 4 of this Ordinance, in contravention of the provisions thereof, or of any other law relating to electric telegraphs, or of any regulation thereunder, shall be liable upon conviction to forfeit all apparatus so used, and to a penalty not exceeding Two Hundred and Fifty Pounds, and, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, and, in case of a second or subsequent conviction, in addition to such forfeiture to a penalty not exceeding Five Hundred Pounds, or in default of payment to imprisonment, with or without hard labour, for a period not exceeding six months.

8. Any Magistrate or Justice of the Peace before whom information shall be given on oath by credible persons, that the provisions of this Ordinance are being, or have been, or are likely to be infringed, may issue a search warrant, and authorise the seizure of any instruments, apparatus or appurtenances reasonably suspected to be intended for use in such contravention.

9. Notwithstanding the provisions of Section 4 of "The Electric Telegraph Act, 1861," all regulations made under the authority of that Act shall be published in the *Gazette*, and be subject, *mutatis mutandis*, to the provisions of Section 7 of Act No. 5 of 1883 of the Cape of Good Hope.

10. This Ordinance may be cited as the "Electric Telegraph Amendment Ordinance, 1904," and shall be read as one with "The Electric Telegraph Act, 1861," of the Cape of Good Hope, and the "Telegraph Protection Ordinance," 1901, and the said laws may be cited together as the "Electric Telegraph Laws, 1861 to 1904."

POSTAL NOTICE No. 55 OF 1912.

B Public attention is hereby directed to the provisions of the "Electric Telegraph Amendment Ordinance, 1904," under which no person not thereto expressly authorised by some law shall erect or make use of any mast, standard or apparatus of any kind for the purpose of signalling without wires by means of electricity, magnetism, electro-magnetism or other like agency, or shall construct any line of electric telegraph except under a licence to be granted by the Administrator.

The term "Line of Electric Telegraph" is defined as any apparatus, instrument, mast, standard, wire, substance, matter or thing whatever which is or may be used for the purpose of sending, transmitting, conveying or receiving signs, signals, or communications.

All persons having, or desiring to have, such lines of electric communication, including telephone lines, whether on their private

property or otherwise, are hereby notified that application for licence to use such lines must be made to the Administrator through the Postmaster-General.

The licence fees payable in respect of such lines, as published in Government Notice No. 391 of 1912 are as follow:—

(a) 1s. per annum for a private telephone or telegraph line exclusively on the private property of the person constructing and using the same;

(b) 10s. per annum for a private telephone or telegraph line passing beyond the boundaries of the owner's land. (The licence does not confer any right to erect telephone or telegraph lines outside the boundaries of the applicant's land, and the applicant must make his own arrangements in this regard);

(c) £50 per annum for any installation of wireless telegraphy or telephony.

All persons having in use lines of electric communication which have not been authorised by the Administrator are hereby notified that unless the required permission be applied for within one month of the date of publication of this Notice they will render themselves liable to the penalties provided in Section 7 of the Telegraph Ordinance above referred to.

GOVERNMENT NOTICE.

No. 391 OF 1912.

DEPARTMENT OF POSTS AND TELEGRAPHS.

The Treasury, Salisbury,
December 19th, 1912.

C It is hereby notified for public information that His Honour the Acting Administrator, with the advice of the Executive Council, has been pleased to approve of the following Regulations regarding the issue of licences for installations of private telephones; telegraphs, or other means of electric communication, whether with or without wires, in terms of section 5 of the "Electric Telegraph Amendment Ordinance, 1904."

By command of His Honour the Acting Administrator in Council.

P. D. L. Fynn, Acting Treasurer.

When any person is authorised to establish or use any means of electric communication as defined in the "Electric Telegraph Amendment Ordinance, 1904," the Postmaster-General may issue to such person an annual licence for the use of such line on payment in advance of the undermentioned fees, namely:—

(a) 1s. per annum for a private telephone or telegraph line exclusively on the private property of the person constructing and using the same;

(b) 10s. per annum for a private telephone or telegraph line passing beyond the boundaries of the owner's land. (The licence does not confer any right to erect telephone or telegraph lines outside the boundaries of the applicant's land, and the applicant must make his own arrangements in this regard):

GOVERNMENT NOTICE.

No. 278.

7th July, 1922.

D It is hereby notified that under the powers conveyed by section 6 of the Electric Telegraph Amendment Ordinance, 1904, the following regulations in regard to the issue of licences for the establishment and operation of private wireless telegraph or telephone installations shall have effect from the date of this notice.

1. Section C of Government Notice No. 391 of 1912 is hereby cancelled.

2. No licence shall be issued except under the authority of the Administrator and on payment of such annual fee as may be specified therein, not exceeding one pound sterling.

3. Applications for licences must be addressed to the Postmaster-General, and must contain the following information:—

(a) The full name and occupation of the occupant;

(b) The address at which the apparatus is proposed to be installed;

(c) A full description of the apparatus, with such diagrams as may be required;

(d) The purpose for which the apparatus is proposed to be used; and

(e) Generally such other information as may be required by the Postmaster-General.

4. An applicant may further be required:—

(a) To produce evidence of British birth or nationality;

(b) To furnish two approved written references as to character;

(c) To satisfy the Postmaster-General by examination or otherwise that he has attained a knowledge of the regulations of the International Radiotelegraphic Convention in so far as they relate to the prevention of interference and impose certain duties on all wireless operators, and that he can read by sound Morse signals at the rate of 12 words per minute; and

(d) To satisfy the Postmaster-General that he has in view some definite object of scientific value or general public utility.

5. Each licence issued under these regulations shall contain a schedule setting forth:—

(a) The maximum power which may be used;

(b) The maximum wavelength;

(c) The maximum dimensions of the aerial;

(d) The stations, if any, with which communication may be established; and

(e) Such other details as may be required.

And the licensee shall not at any time exceed or vary the limits or conditions therein laid down except with the consent in writing of the Postmaster-General.

6. The granting of any licence under these regulations shall not in any way vary or detract from the rights, powers or privileges of the Postmaster-General as defined by law or regulation, nor shall it involve any obligation or responsibility on the Postmaster-General for any matter or thing which may be done by the licensee or his agents.

7. All apparatus and plant installed under licence shall be subject to the approval of the Postmaster-General, and to inspection by any of his officers duly authorised thereto from time to time.

8. The licensee shall comply with all directions which shall be given to him by the Postmaster-General, and shall at any time cease to work, or shall completely dismantle the licensed apparatus and plant upon notice to do so in writing from the Postmaster-General.

9. The licensee shall not divulge to any

unauthorised person, or make any use whatever of any message coming to his knowledge by means of his apparatus, and not intended for his use.

10. The licensee shall account to the Postmaster-General for any rates of fees that may be chargeable on any message passing through his apparatus.

11. Except with the consent in writing of the Postmaster-General the licensee shall not permit the use of his apparatus by any other person nor shall he assign or dispose of any rights, powers or privileges granted to him by licence.

12. The Postmaster-General may at any time give notice in writing to determine any licence granted under these regulations.

DEPARTMENT OF POSTS AND TELEGRAPHS, SOUTHERN RHODESIA.

E LICENCE TO ESTABLISH AND WORK A PRIVATE WIRELESS TELEGRAPH STATION.

Under the powers conveyed by Section 6 of the "Electric Telegraphs Amendment Ordinance 1904," and "Government Notice No. 278 of 1922," a licence is hereby issued to.....

to establish and work apparatus for wireless at provided such apparatus shall be of the character specified in the Schedule hereto.

The licensee agrees to abide by the regulations regarding the working of wireless installations as published by Government Notice No. 278 above referred to and to carry out any of the requirements of the Postmaster-General as therein laid down.

General Post Office,
Salisbury.

.....19..

Postmaster-General.

Licensee.

Place.....

Date.....

SCHEDULE

to licence granted to..... to establish and work apparatus for..... of wireless signals.

(1) *Transmission:*

(a) Maximum power.....

(b) Maximum wavelength

(2) *Aerial:*

(i) Maximum height above ground.....

(ii) Total length of aerial, including leading-in wires:—

(a) ...ft. for single wire aerial.

(b) ...ft. where two or more wires are used.

(3) *Stations with which communication may be established:—*

Transmission

Reception:

(4) *Apparatus*

General Post Office,
Salisbury.

.....1924.

Postmaster-General.

ROUMANIA

(See Maps 3 and 14).

THE country was formed by the fusion of the two Principalities of Moldavia and Wallachia in 1861. The present ruler is King Ferdinand I.

CONTROL.

All wireless telegraphic or telephonic services and stations are owned

and operated by the State. The general control is in the hands of the Direction-Generale des Postes and Telegraphes.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
M. Emile Giurgea, D. Sc.	Director of Radio Communication	Str. Renasterei, 6, Bucharest
M. Emil Geles	Radio Engineer	Bucharest
M. Aurel Demetresco ..	Laboratory Engineer.. ..	Bucharest
M. André Bruneano ..	Engineer-in-charge of the Station.. ..	Herastrau Bucharest

The Director of Radio Communications supervises all technical matters relating to the erection of new stations, and in conjunction with the Director-General of Posts and Telegraphs convokes, when necessary, a general committee of Wireless Telegraphy to consider important resolutions.

ORGANISATION.

In addition to the commercial land stations, there are a number of small military stations, movable, and Direction-Finding stations.

The principal land stations are at Herestrau near Bucharest (where the transmitting apparatus comprises two 50 kW. alternators, a 30 kW. arc and four valve sets ranging from $\frac{1}{2}$ kW. to 2 kW.), Galatz, Constanza, Oradea Mare, Timisoara, Turnu Severin and Cluj, while further stations are in course of erection or are projected for Craiova, Cluj, Galatz, Constanza, Jassy, Kichenev and Cernowitz. A special commission is considering matters in connection with broadcasting.

The Soci  t   Radio Rom  n   has erected most of the Roumanian stations, and arrangements for their maintenance by this Company are under consideration.

ADMINISTRATION.

Roumania signified her adherence to the International Radiotelegraphic Convention in 1913 and the regulations concerning Wireless Telegraphy date back to 1914. A new law and fresh regulations are in course of preparation.

SAINT HELENA

(See Maps 24 and 33)

Including : Tristan da Cunha and Ascension Island.

ST. HELENA is an Admiralty coaling station and a resting place for the Eastern Telegraph Company's cable between Cape Town and St. Vincent (Cape Verde Islands).

Tristan da Cunha is a small group of islands in the Atlantic half way between the Cape of Good Hope and South America. At present there is no wireless communication, but efforts are being made to erect a set suitable for communication with the outer world.

The Island of Ascension, 700 miles to the north and an important Cable Station of the Eastern Telegraph Co., is now a dependency of St. Helena. The Admiralty Wireless Station has been dismantled.

ADMINISTRATION.

Wireless Telegraphy is administered under the following Ordinance and Regulations :—

A—Wireless Telegraphy Ordinance, No. 2 of 1913.

B—Regulations.

WIRELESS TELEGRAPHY ORDINANCE.
No. 2 OF 1913.

A In the Fourth Year of the Reign of His Majesty King George V.
Major Harry Edward Spiller Cordeaux,
Companion of the Most Honourable Order of the Bath; Companion of the Most Distinguished Order of Saint Michael and Saint George;

Governor and Commander-in-Chief. 14th July, 1913

An Ordinance to provide for the regulation of wireless telegraphy

Be it enacted by the Governor of St Helena as follows :—

I. This Ordinance may be cited as the "Wireless Telegraphy Ordinance, 1913."

II. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

III. A person shall not establish any wireless telegraphy station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

2. Every such licence shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

IV. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

V. The Governor in Council may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

2. The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

3. If at any time, in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

VI. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place, or on board any merchant ship without a licence in that behalf, or contrary to the provisions of any regulations made under this Ordinance, or of any licence granted under this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by the chief of police and named in the warrant and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place, or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

VII. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding £50, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection

with which the offence was committed shall be seized and forfeited.

2. Proceedings shall be taken before the police magistrate on the complaint of the chief of police or of any other person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

VIII. "The Wireless Telegraphy Ordinance, 1912," is hereby repealed.

GOD SAVE THE KING!

Given under the Public Seal of the Island of St. Helena this 14th day of July, 1913.

By command of His Excellency the Governor,
(Signed) A. HANDS,
Chief Clerk.

REGULATIONS.

Made by the Governor-in-Council under Ordinance No 2 of 1913 entitled
B "An Ordinance to provide for the Regulation of Wireless Telegraphy"

I. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

II. In these regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

III. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

IV. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

V. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

VI. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made by the Governor in Council this 14th day of July, 1913.

(Signed) A. HANDS,
Chief Clerk.

SALVADOR

(See Map 44.)

THE independent Republic of El Salvador is on the West Coast of Central America.

The form of Government is Republican, democratic and representative, with three branches of Administration: (1) The Executive, which comprises the President and Cabinet Ministers; (2) the Legislature or National Assembly; and (3) the Judiciary.

CONTROL AND ORGANISATION.

The only wireless station is at the southern end of the city of San Salvador. It was presented by the Government of Mexico, and is known by the name of "Estación Venustiano Carranza." It is open to public correspondence with ships, and for official traffic with all Central American Republics and Mexico.

Radiotelegraphy is a State monopoly and is under the control of the Telegraph and Telephone Administration, one of the departments of the "Ministerio de Gobernacion y Fomento." Private companies or individuals are permitted under licence from the Government to erect and work wireless telegraph and telephone stations provided the present contract with the Cable Company is not infringed.

It is proposed to erect a Broadcasting Station with a power of 500 watts.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. D. Rodolfo Schöenberg	Minister of Public Works.. ..	San Salvador City
Don Ricardo Posada	Director of Telegraphs	San Salvador City

ADMINISTRATION.

At present there are no special laws regulating wireless telegraphy, but local regulations have been approved by the Executive Authorities for the licensing and control of amateur stations.

SARAWAK.

THE Administration is conducted by the Rajah, Charles Vyner Brooke, assisted by a Supreme and a General Council. The Civil Service is composed of British officers selected by the Rajah.

CONTROL.

The Radiotelegraph and Telephone Department is a separate unit from the Post Office, and is in the sole charge of the manager, who deals in all matters relating to the wireless telegraph and telephone service.

The principal officers are: Messrs. J. R. Barnes (Manager), A. D. Taylor (Chief Assistant) and P. Down (Accountant).

ORGANISATION.

The Chief Station is at Kuching, the capital of Sarawak, and there are ten other land stations used for Government and Commercial traffic and all equipped for radiotelephony, the c.w. and telephone sets having been designed and constructed locally. Music is broadcast three times weekly from Kuching.

ADMINISTRATION.

There are no regulations obliging ships trading in Sarawak waters to be fitted with wireless.

The following are the regulations relating to wireless in the Protectorate of Sarawak.

A—Wireless Telegraphy Order, 1921.

ORDER, No. XIX, 1921.

A 1. This Order may be cited as the "Wireless Telegraphy Order, 1921," and shall come into force upon the publication thereof in the *Government Gazette*.

2. (i) In this Order the expression "Wireless Telegraphy" means any system of communication by telegraph or telephone without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(ii) Nothing in this Order shall prevent any person from making or using apparatus for actuating machinery or for any purpose other than the transmission or reception of messages.

3. His Highness the Rajah, whenever he shall deem it expedient so to do, may licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in Sarawak or on board any ship registered in Sarawak.

4. (i) No person shall erect or establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place on board any ship registered in Sarawak except under and in accordance with a licence granted by His Highness the Rajah.

(ii) Every such licence shall be in such form and for such period as His Highness the Rajah may determine, and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as His Highness the Rajah shall consider desirable in the public interest.

5. (i) If any person erects or establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be liable to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Order except with the previous sanction of His Highness the Rajah.

(ii) On being satisfied by information that there is reasonable ground for believing that a wireless telegraph station has been erected

or established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf, a Judge of the Supreme Court or Police Magistrate or District Officer may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. The regulations in the schedule to this Order shall have effect except in so far as they may be amended or rescinded by further regulations made by His Highness the Rajah for carrying into effect the purposes of this Order.

7. (i) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Order or of any regulation made thereunder, or in breach of the conditions and restrictions subject to or upon which any licence has been issued, shall be deemed to be an offence against this Order, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(2) All convictions, forfeitures and fines under this Order or any regulations made thereunder, may be had and recovered before a Resident's Court.

THE SCHEDULE.

(1) All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the State shall be worked in such a way as not to interfere with the working of any wireless telegraphy station lawfully established, installed or worked in the State or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any harbour of the State except with the special or general permission of His Highness the Rajah.

(3) These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

By Order of His Highness the RAJAH.

SEYCHELLES ISLANDS

(See Maps 21 and 25)

THIS Colony consists of a group of islands belonging to Great Britain, and under the administration of the Governor, Brig.-Gen. Sir Joseph Byrne, K.B.E., C.B., at Mahé.

ADMINISTRATION.

Radiotelegraphy is administered under the Ordinances, the text of which will be found below, and which cancel "The Telegraphic and Electrical Stations Ordinance, 1903," printed in our former issues.

There are no private or commercial wireless installations.

The list of current rules here included is as follows:—

A—Ordinance No. 3 of 1914.

B—Ordinance No. 11 of 1917.

C—Regulations (No. 127) thereunder.

ORDINANCE NO. 3 OF 1914.

Dated February 19th, 1914.

Enacted by the Governor of the Colony of Seychelles with the advice and consent of the Legislative Council thereof.

A To provide for the regulation of wireless telegraphy.

Be it enacted by the Governor of the Colony of Seychelles with the advice and consent of the Legislative Council thereof, as follows :—

1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1914."

2. In this Ordinance and in any regulation made thereunder the expression "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may whenever he shall deem it expedient to do so licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Colony or on board any British registered in the ship Colony.

4. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor in Executive Council may determine and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as the Governor shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding two thousand rupees (Rs. 2,000) or to imprisonment for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Ordinance without the previous sanction of the Crown Prosecutor.

(2) If the Chief Justice or the Police Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant to any Police Officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Governor in Executive Council may make regulations for all or any of the following matters :—

(i) for prescribing the form and manner in which applications for licence under this Ordinance are to be made;

(ii) for prescribing the fees payable on the grant of any licence;

(ii) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship whether British or foreign in the waters of the Colony shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) for prohibiting except with the special or general permission of the Postmaster of the Colony the working or using of any apparatus for wireless telegraphy on board a merchant ship whether British or foreign whilst such ship is in any of the harbours of the Colony;

(v) for prohibiting or regulating in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships whether British or foreign in the waters of the Colony the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraph (iii) (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the Governor that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy a licence for that purpose shall be granted subject to such special terms, conditions and restrictions as the Governor may think proper but shall not be subject to any rent or royalty.

8. Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Ordinance and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine of one thousand Rupees (Rs. 1,000).

9. Ordinance No. 4 of 1903 is hereby repealed.

ORDINANCE NO. 11 OF 1917.

AN ORDINANCE TO AMEND ORDINANCE NO. 3 OF 1914.

Dated September 1st, 1917.

B Be it enacted by the Governor of the Colony of Seychelles by and with the advice and consent of the Legislative Council thereof, as follows :—

1. This Ordinance may be cited as "The Wireless Telegraph (Amendment) Ordinance, 1917," and shall be construed as one with the Wireless Telegraph Ordinance, 1914.

2. Section 6 (iv) of the Wireless Telegraphy

Ordinance, 1914, is hereby repealed and replaced by the following:—

(iv) For prohibiting except with the general or special permission of the Governor, the working or using of any apparatus for wireless telegraphy on board any ship whether British or foreign other than His Majesty's ships of war, whilst such ship is in the waters of this Colony and for the control or disposal of any apparatus, instrument or thing which may be used in connection with wireless telegraphy on board any ship (other than His Majesty's ships of war) whilst such ship is in the waters of the Colony.

3. Section 6 (2) of the Wireless Telegraphy Ordinance, 1914, is hereby repealed.

4. (1) The Governor may appoint officers for the purpose of seeing that the provision of the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, and any regulations made thereunder are complied with and it shall be lawful for such officers to go on board any ship whether British or foreign whilst any such ship is at anchor in the waters of the Colony to see that such provisions are complied with.

(2) If any such officer is molested, obstructed, hindered or insulted while in the execution of his duties an offence shall be deemed to have been committed.

5. For the purpose of any proceedings under the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, or under any regulations made thereunder, the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship and for any breach of the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, and any regulations made thereunder.

6. Any summons or other document in any proceedings under the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been

committed with the person being or appearing to be in command or charge of the ship.

7. The regulations published in *Gazette* No. 22 of 1914 under Government Notification No. 52 of 1914 are hereby repealed.

Passed in the Legislative Council at a meeting held on the 27th August, 1917.

REGULATIONS.

No. 127 of 1917.

1. The radiotelegraph stations on board ships (other than His Majesty's ships of war) shall not be worked whilst such ships are within any harbour or bay of the Colony.

2. For the proper enforcement of section 1 of these regulations ships of British register in any harbour or bay of the Colony must completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected.

3. (1) Ships of foreign register in any harbour or bay of this Colony must, subject to the provisions of sub-section 2 of this section take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus.

(2) Ships of foreign register remaining in a harbour or bay of this Colony for less than twelve hours may, at the discretion of the Governor, be permitted to leave their aerials up, provided the same are disconnected in accordance with the provisions of section 2 of these regulations.

4. Any officer appointed under the provisions of section 4 of Ordinance No. 11 of 1917 may order that the radiotelegraph cabin on board any ship (other than His Majesty's ships of war) be sealed and he shall thereupon affix his seal to such cabin.

If any seal so affixed is removed or tampered with an offence shall be deemed to have been committed against these regulations.

Made by His Excellency the Governor in Executive Council at a meeting held on the 24th day of September, 1917.

SIAM

(See Maps 17, 18 and 23.)

THE integrity of the Kingdom of Siam is guaranteed by France and Great Britain under mutual agreement. The form of government is an absolute monarchy, with an Executive Council of ministers. The reigning king is Somdech Phra Rama Tipati Srisindra Maha Vajiravudh, generally known as King Rama VI.

CONTROL.

Radiotelegraphy is organised in Siam under supervision of the Minister of Marine, but it is now controlled by the Ministry of Communications in so far as the public is concerned. The first stations erected were those at Saladeng in Bangkok, and at Songkhla*; both these land stations are directly controlled by Government.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Eng. Capt. Phra Vidya Duralikhit	Head and Chief Engineer of Radiotelegraphic Department	Wireless Station, Bangkok.
Eng. Lieut.-Commander Luang Jamnarn Aggikich	Assistant Engineer.	Wireless Station, Bangkok.

* Sometimes spelt "Singora."

ORGANISATION.

There are experimental, amateur, and instructional stations at Saladeng. There are also ship stations on Government vessels.

ADMINISTRATION.

The law and regulations under which radiotelegraphy is administered in Siam will be found below.

A—Radiotelegraph Law, B. E. 2457 (1914).

B—Notice concerning the opening of Radiotelegraphy for Public Service, B. E. 2462 (1919).

C—Ministerial Regulations relating to the use of Radiotelegraphy, B. E. 2462 (1919).

D—Radiotelegraph Amendment Act, August 4th, 1921.

RADIOTELEGRAPH LAW.

A This Law may be cited as "The Radiotelegraph Law, B.E. 2457" (1914).

2. It shall come into force from the date of its publication in the Government Gazette.

COAST AND LAND STATIONS.

3. The right to establish and work radio-stations for telegraphic and telephonic purposes on Siamese soil and on board ships permanently anchored in Siamese territorial waters is an exclusive privilege of the Government.

This privilege shall be reserved to the Department of Posts and Telegraphs in the Ministry of Communications.

4. The Army and Navy may establish and work independently radiotelegraph stations or field apparatus subject to such conditions as may be from time to time sanctioned in writing by the Minister of War or Marine.

Any station established under this section may be opened to public correspondence only under special arrangement with the Department of Posts and Telegraphs.

SHIP STATIONS.

5. No merchant ship under the Siamese flag shall establish or work any radiotelegraph or telephone apparatus without a licence from the Minister of Communications.

The Minister of Communications shall not grant such licence until he has been satisfied that the apparatus can work in accordance with the provisions of the International Radiotelegraph Convention of London, 5th July, 1912, and will be handled by qualified operators.

Such licence shall be for such time and subject to such conditions as the Minister of Communications may deem good.

6. No ship, whether under the Siamese or a foreign flag, excepting ships of war, is allowed while in Siamese territorial waters to send a message by means of her radiotelegraph apparatus when and where such message can be forwarded by the Government system, either with or without wires, except for the purpose of transmitting messages to or from a ship in distress.

SECRECY.

7. No person or persons engaged in or having knowledge of the operation of any radio-station shall disclose the contents of any message transmitted or received by such station for the purpose of transmission, except to the person to whom the same may be directed or his authorised agent, or to another station employed to forward such message to its destination or in obedience to the direction of a Court of competent jurisdiction.

PENALTIES.

8. Whoever establishes or works any apparatus contrary to the provision of Sections 3 and 6, or in excess of the conditions laid down under Section 4 of this Law, shall be punished with imprisonment not exceeding six months or fine not exceeding five hundred ticals or both.

The captain or master of a ship, and the person directly responsible for the offence, if any, shall both be liable to punishment for every infringement of the provisions of Section 6.

9. Any person infringing Section 5 of this law shall be punished with fine not exceeding one hundred ticals.

10. Upon the conviction of any person of an offence under the foregoing sections, the Court may order the forfeiture of any apparatus used for the commission of such offence.

11. Any person injuring apparatus or committing any act of mischief to a radiotelegraph station lawfully established, or doing anything to prevent or intended to prevent the transmission or delivery of any radiotelegraph message by any such station, shall be guilty of an offence under Section 196 of the Penal Code.

12. Whoever commits any offence against Section 7 of this Law shall be punished under Section 279 to 281 of the Penal Code.

EXECUTION.

13. The Minister of Communications shall have charge and control of the execution of this Law.

It shall be lawful for him to frame regulations and to fix the scale of fees for land, coast, and ship charges in the transmission of messages by radiotelegraphy or telephony, as well as for licences under Section 5.

It shall also be lawful for him to frame regulations about the qualifications required from operators.

All such regulations shall be in accordance with the detailed Service Regulations appended to the International Radiotelegraph Convention.

Such regulations, on being sanctioned by His Majesty and published in the Government Gazette, shall be deemed to be part of this Law.

Given on the 24th day of April, B.E., 2457 (1914), being the 1,261st day of the Present Reign.

BY THE KING'S MOST EXCELLENT MAJESTY.

Whereas His Majesty's Government has always reserved to itself the exclusive right to establish and work means of telegraphic and telephonic communications throughout Siam;

And whereas apparatus for wireless telegraphy has now been devised practicable for use by land and sea;

And whereas it is desirable that ships under the Siamese flag, more especially passenger carriers, should be equipped with such apparatus, worked under proper regulations, for the greater safety of life at sea;

And whereas the regulations necessary to insure the proper and efficient working of wireless telegraphic stations must conform in all respects with the provisions of the International Radiotelegraph Convention of London, 1912, to which His Majesty's Government has been a party;

Therefore His Majesty has been pleased to enact the following law:—

NOTICE CONCERNING THE OPENING OF RADIOTELEGRAPHY FOR PUBLIC SERVICE.

Dated 22nd May, 1919.

B In view of the progress made in commerce and trade in this country, it is considered that the use of Radiotelegraphy which was originally established by the Royal Government for its own use should be extended to general public.

The Ministry of Communications having submitted these facts before His Majesty the King, has now obtained the Royal Permission that the Naval Radiotelegraphic stations in Bangkok and at Singora (Songkhla) should be open to public use from the 1st June, 1919.

The public radiotelegraphic service will be under the management of the telegraph officials of the Post and Telegraph Department, who will receive and despatch radiotelegraphic telegrams in a similar manner to the despatch of other telegrams in the Kingdom.

Senders of radiotelegraphic messages should write clearly the words "Wireless Telegraph" on the upper left-hand corner of the form supplied, before the names of the persons for whom the messages are destined.

(Sd.) 1st Grand Councillor,

Chao Phya Wongsa Nuprabadh,
Minister of Communications.

MINISTERIAL REGULATIONS

FOR THE LICENSING OF RADIOTELEGRAPHY UPON SHIPS, THE ISSUING OF CERTIFICATES OF COMPETENCY TO RADIOTELEGRAPH OPERATORS, THE FIXING OF FEES FOR SUCH LICENCES AND CERTIFICATES AND THE FIXING OF FEES FOR LAND, COAST AND SHIP CHARGES IN THE TRANSMISSION OF MESSAGES BY RADIOTELEGRAPHY

C Whereas under Sections 5 and 13 of the Radiotelegraph Law, B.E. 2457, the Minister of Communications is empowered to licence the establishment and working of radiotelegraph apparatus upon merchant ships under the Siamese Flag, to frame regulations about qualifications required from operators and to fix the scale of fees for land, coast and ship charges in the transmission of messages by radiotelegraphy, such Regulations, on being approved by His Majesty and published in the Government Gazette to be deemed to be part of the Law.

It has now pleased His Majesty the King to authorise the Minister of Communications to issue the following Ministerial Regulations:—

1. The operation of radiotelegraph stations upon any merchant ship under the Siamese Flag must conform to the provisions of the International Radiotelegraph Convention of London, July 5th, 1912, the detailed Service Regulations appended to the said International Radiotelegraph Convention, the Radiotelegraph Law, B.E. 2457 and any amendments and alterations which may be made therein, and the regulations from time to time issued by the

Minister of Communications under the authority of said Radiotelegraph Law, B.E. 2457.

2. No person shall work the radiotelegraph upon any merchant ship within Siamese territorial waters in such a way as to interrupt or interfere with

(a) Naval or military signalling.

(b) The transmission of messages between other radiotelegraph stations lawfully established.

3. Before the installation of any radiotelegraph apparatus upon any merchant vessel under the Siamese Flag, an application shall first be filed with the Minister of Communications, according to Form A of Schedule I, attached hereto. If the Minister of Communications is satisfied that the apparatus described in said application will, when installed, be capable of working in accordance with the requirements of Section 4 (a) of these Regulations, an installation licence will be issued according to Form B. of said Schedule I. When the installation is completed, the applicant shall notify the Minister of Communications, who thereupon will cause an inspection to be made. If this inspection is satisfactory, the Minister of Communications will issue a ship licence according to Form C, and subject to the conditions therein contained. Such ship licence shall be good until March 31st after its date, but may be renewed within one month immediately after the expiration of the period for which it was issued. Such installation licences and ship licences shall be executed in duplicate, one copy to be retained by the Ministry of Communications and the other given to the licensee.

4. The Minister of Communications shall not grant such ship licence unless he is satisfied that—

(a) the radiotelegraph apparatus can be worked in accordance with the provisions of the International Radiotelegraph Convention of London and the detailed Service Regulations appended thereto, and that,

(b) operators qualified in accordance with the provisions of these Regulations and who are the holders of the certificates provided for herein will be employed to work the same.

5. A separate licence is required for each ship belonging to the same owner.

6. The fee for the issuance of each ship licence shall be 5 Bahts and a fee of the same amount shall be charged for each renewal thereof.

7. No person shall work a radiotelegraph on board any merchant ship under the Siamese Flag unless he holds either a first or second-class certificate of competency granted by the Minister of Communications.

8. The Minister of Communications shall grant certificates of competency in accordance with the conditions contained in the second Schedule to these Regulations.

9. Should a holder of a certificate of competency granted under these rules be proved to the satisfaction of the Minister of Communications wilfully or negligently to have failed to comply with the provisions of the International Radiotelegraph Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B.E. 2457 or the Regulations issued by the Minister of Communications, or any amendments or modifications of any of these or any other Regulations which may be issued from time to time for his guidance, the Minister of Communications may cancel the certificate.

10. The Minister of Communications or any officer authorised by him may require the holder of a certificate of competency to produce

the same for cancellation under Regulation 9, and the holder must comply with such requirement.

11. Nothing in these Regulations shall apply to the use of the radiotelegraph for the purpose of making or answering signals of distress.

12. Rates for messages transmitted to or received from ship stations shall be as follows :—

Coast station transmitting or receiving charge for radiotelegrams to or from ships, 20 satangs (0.40 francs) per word with a minimum charge of 2 Bahts (4.00 francs).

Land charges for the receipt or transmission of radiotelegrams over the Inland Telegraph System shall be those provided in the published tariff for inland messages. Land charges shall in addition include the actual expenses of postage or carriage, if the message is to be delivered outside of established telegraph districts.

Charges for relaying messages outside of Siam shall be fixed in accordance with published international tariffs.

These rates may be modified or supplemented and rates fixed for the charges at ship stations by the Minister of Communications.

III.

The ship licence provided for in Regulation 3 shall be in the following form and subject to the following conditions :—

FORM C.

Know all men by these presents that, whereas.....of.....hereafter called the "licensee," is desirous of establishing, maintaining and working on the ship..... belonging to the licensee, radiotelegraphy under Section 5 of the Radiotelegraph Act, B.E. 2457 ;

And whereas the licensee has agreed and by the acceptance of this licence, does become bound to operate and maintain the radiotelegraph installation for which this licence is granted in accordance with the International Radiotelegraph Convention of London of July

5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B.E. 2457, and the Regulations thereunder by the Minister of Communications, and any and all amendments and modifications of any of these, which may be made from time to time ;

Now the Minister of Communications hereby grants to the licensee during the term or period commencing with the date hereof and terminating on the 31st day of March, B. E. 24.... (19), licence and permission ;

(1) To establish, maintain and work for the purpose hereinafter mentioned upon the shipbut subject in all respects to the provisions of said International Radiotelegraph Convention of London, July 5th, 1912, to the Service Regulations appended thereto, the Radiotelegraph Law of B.E. 2457, and the Regulations issued by the Minister of Communications, and all amendments and modifications of any of these, apparatus for radiotelegraphy known as the.....system of radiotelegraphy.

(2) To transmit and receive messages by means of the licensed apparatus between the said ship and coast stations and other ship stations ;

(3) To receive money or other valuable consideration for or in respect to the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus, according to the schedule of charges fixed in the Regulations or by the Minister of Communications.

And it is hereby declared that the said licence and permission is granted upon and subject to the following further conditions and provisions :—

(1) The licensed apparatus shall not be used by the licensee or by any other person either on behalf of or by permission of the licensee for the transmission or receipt of any messages except those authorised by this licence.

SCHEDULE I.

Conditions and Forms of application for Licence to install Radiotelegraph Apparatus on ships Installation Licence, and Ship Licence.

I.

Application for installation licences shall be made according to the following form :—

FORM A.

I,.....of.....the owner of the ship.....do hereby make application for permission to install upon said ship apparatus for radiotelegraphy according to the following specification :—

SPECIFICATION.

Name of Ship.	Normal range of Signalling in Nautical Miles		Character of Apparatus		Power			If Alternator is used, Number of Cycles per second
	by day	by night	Description of Receiving Apparatus	Wave-length in Metres	Source and Maximum Output	Maximum taken by Transmitting Instruments.		
						Current V of tage		
1	2	3	4	5	6	7	8	9

The above described apparatus will be installed in.....months.

Signed.....

II.

Licence for installation of Radiotelegraph Apparatus upon ships shall be according to the following form :—

FORM B.

Licence for installing Radiotelegraph Apparatus.

Whereas.....of.....has filed with the Ministry of Communications his application dated.....for the installation of radiotelegraph apparatus upon the ship.....

Now the Minister of Communications does hereby licence and permit the installation upon the said ship within the period of.....months from date of radiotelegraph application in accordance with the following specification :

Name of Ship.	Normal range of Signalling in Nautical Miles		Character of Apparatus		Power			If Alternator is used, Number of Cycles per second
	by day	by night	Description of Receiving Appar'tus	Wave-length in Metres	Source and Maximum Output	Maximum taken by Transmitting Instruments.		
						Current	Voltage	
1	2	3	4	5	6	7	8	9

This licence and permission does not permit the licensee to operate said apparatus above described until after its inspection when installed and the issuance of a ship licence.

Signed.....
Minister of Communications.

(2) (a) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval or Military signalling or with any radiotelegraph station lawfully established.

(b) If at any time it becomes apparent that the working of the licensed apparatus upon said ship is inconsistent with the free use of naval or military signalling the licensee shall when required to do so by the Minister of Communications close said station upon said ship.

(3) The licensee shall comply with all such directions and observe all such rules and regulations as may be given or made by the Minister of Communications from time to time for the purpose of preventing interference with the working of any other radiotelegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station.

(4) The licensee shall at all times indemnify His Majesty's Government, the Minister of Communications and the Department of Posts and Telegraphs against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any damage arising from any act licensed or permitted by these presents.

(5) Subject to the provisions of this licence, the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or precedence whether as regards rates of charge, order of transmission or otherwise, except that preference shall be given to messages transmitted on behalf of His Majesty or of His Majesty's Government.

(6) The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed

apparatus, or any other means in the power of the licensee.

(7) The licensed apparatus shall be worked only by a person holding a certificate of competency issued by the Minister of Communications.

(8) The licensee shall not divulge to any person other than properly authorised officials of His Majesty's Government or make any use whatever of any message coming to the knowledge of the licensee through naval or military signalling.

(9) The licensee shall keep such accounts records and registers of all messages transmitted by means of the licensed apparatus as the Minister of Communications may from time to time require and such accounts, records and registers shall be open to the inspection of the Minister of Communications or his duly authorised representative at all reasonable times.

(10) The Minister of Communications or his duly authorised representative may at all reasonable times enter upon said ship for the purpose of inspecting and may inspect any apparatus fixed or being in such ship for the purpose of sending and receiving messages by radiotelegraphy, and the method of working such apparatus.

(11) The Minister of Communications may at any time by notice in writing but without assigning any reason revoke and determine this licence and thereupon this licence shall determine and become absolutely void.

(12) Any notice, request or consent (whether required to be in writing or not) to be given by or on behalf of His Majesty's Government or by the Minister of Communications or the Director-General of the Post and Telegraph Department, may be served by sending the same in a letter addressed to the licensee at the office for the time being of the licensee, or by delivery to the master of the ship upon which the licensed apparatus is installed and any notice to be given by the licensee under

these presents may be served by sending the same in registered letter addressed to the Minister of Communications.

Signed and delivered by.....
Minister of Communications.

SCHEDULE II.

CONDITIONS AND FORMS FOR THE GRANTING OF CERTIFICATES OF COMPETENCY.

(1) Certificates of competency as to radiotelegraph operators on board merchant ships under the Siamese Flag shall be granted by the Minister of Communications, subject to an examination and shall be in accordance with Form B appended hereto. Such certificates shall indicate the system or systems of radiotelegraphy in which the examination was conducted, and shall certify that the holder:

(a) In the case of first-class certificates is able to send and receive, by sound, messages in plain language in the International Morse Code at a rate of not less than 20 words per minute (five letters being counted as one word); or

(b) In the case of second-class certificates is able to send and receive by sound, messages in plain language in the International Morse Code at a rate of from 12 to 19 words per minute (five letters being counted as one word); and

(c) Is able to adjust the apparatus ordinarily used in some well-known system of radiotelegraphy so as to suit the varying conditions of working without using excessive transmitting power; and

(d) Has an efficient working knowledge of the regulations applicable to the exchange of the radiotelegraphic traffic.

(2) Candidates for examination shall fill up an application according to Form A attached hereto, and submit the same to the Minister of Communications at Bangkok.

(3) Upon being notified that he has successfully passed the examination each candidate shall supply two photographs of himself, one of which will be attached to the certificate of competency, and the other to the duplicate of the certificate which is retained by the Minister of Communications. These photographs will be signed by the candidates and stamped by the issuing officers in such a way as to prevent substitution.

(4) A fee of 10 Bahts will be charged for each examination and an additional fee of 10 Bahts for the certificate issued to a successful applicant.

(5) Each certificate shall be good for five years and may be renewed at the expiration of that period for a like period of five years. Such renewal may be without re-examination if the applicant has been engaged in the actual transmission and receipt of radiotelegrams during at least three of the preceding five years. Otherwise an examination will be required. The fees for renewal examinations and the issuance of renewal certificates are the same as for the original examination and issuance.

(6) If the candidate satisfactorily passes the examination, he shall make a declaration that he will observe the secrecy of radiotelegrams which come to his knowledge in the course of duty.

FORM A.

Application for examination for a.....
class certificate of competency as a radiotelegrapher.

1. Name
2. Residence

3. Date and Place of Birth.....
4. Nationality
5. System of radiotelegraph in which applicant wishes to be examined

The undersigned applicant for examination for a certificate of competency as a radiotelegrapher agrees that, if successful, he will observe all requirements, so far as they may apply to him, of the International Radio-Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B.E. 2457, the Regulations used in pursuance thereof, and all amendments and modifications of any of these, which may be issued from time to time.

(Signature).....

FORM B.

....CLASS CERTIFICATE OF COMPETENCY.

Whereas.....having been examined as to his competency as a radiotelegrapher, according to the Regulations in such case made and provided and said examination having been successfully passed

It is hereby certified that.....is able to send and receive by sound messages in plain language in the International Morse Code at the rate of.....words per minute (five letters being counted as one word) and is able to adjust the apparatus ordinarily used in the.....system of radiotelegraphy so as to suit varying conditions of working, without using excessive transmitting power and has an efficient working knowledge of the regulations applicable to the exchange of radiotelegraphic traffic.

Accordingly this.....class certificate of competency has been issued to the said.....who by accepting it agrees to be bound, so far as they may apply to him, by all provisions of the International Radiotelegraphic Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraphic Law B.E. 2457, and the Regulations issued under the authority thereof, and any amendments and modifications of any of these which may be issued from time to time.

Signed and delivered by.....
Minister of Communications.

BACK.

Name

Residence

Date and Place of Birth.....

Nationality.....

I do hereby declare that I will observe the secrecy of radiotelegrams which come to my knowledge in the course of duty.

(Photograph).

THE RADIOTELEGRAPH AMENDMENT ACT.

BY THE KING'S MOST EXCELLENT MAJESTY

Whereas the authority conferred upon the Minister of Communications by virtue of Article 13 of the Radiotelegraph Act B.E. 2457 is not sufficient to execute and control the Radiotelegraph service.

Therefore His Majesty has been pleased to further amend the Radiotelegraph Act B.E. 2457 as follows:—

- (1) This Act shall be called the Radiotelegraph Amendment Act, 2464.

(2) It shall come into force from the 4th day of August, 1921.

(3) In Chapter VI Article 13 after paragraph 3 of the Radiotelegraph Act B.E. 2457, the following paragraph shall be inserted, namely: It shall also be lawful for him, whenever he

deems expedient, to issue notifications granting temporary permission to ships to send and receive messages by means of their wireless apparatus while in Siamese territorial waters. Given on the 4th day of August, 1921, being the twelfth year of the Present Reign.

SIERRA LEONE

(See Maps 24 and 26.)

THE administration of the Colony of Sierra Leone is conducted by a Governor and Commander-in-Chief assisted by Executive and Legislative Councils. The same officials also administer the "Protectorate" a term which applies to the territories not being portions of the Colony of Sierra Leone lying between 6° and 10° north latitude and 10° and 14° of west longitude.

CONTROL.

A wireless telegraphy station is installed at Freetown, and is owned and controlled by the African Direct Telegraph Company.

The regulation of wireless telegraphy rests solely in the hands of the Government. There are no wireless clubs or societies.

ADMINISTRATION.

The Sierra Leone wireless laws and regulations were first formulated in Ordinance No. 22 of 1903. In 1912 this Ordinance was replaced by Ordinance No. 19 with the Schedule which was thereto attached. In the following year (1913) these were in their turn replaced by Ordinance No. 11 with its accompanying Schedule, both of which we print below. A set of Regulations issued on July 16th, 1917, has been superseded by an additional set issued on May 12th, 1919, which will be found below.

The list of reprints included here covers:—

A—Ordinance No. 11 of 1913.

B—Schedule dated May 23rd, 1913.

C—Regulation No. 1 of 1919.

ORDINANCE NO. 11 OF 1913.

TO PROVIDE FOR THE REGULATION OF WIRELESS TELEGRAPHY.

A Be it enacted by the Governor of the Colony of Sierra Leone, with the advice and consent of the Legislative Council thereof as follows:—

1. *Short Title.*—This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1913.

2. *Definition of "Wireless Telegraphy."*—In this Ordinance, "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. *Licence for Wireless Telegraphy.*—(1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony, except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. *Apparatus aboard ships to be worked in accordance with regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

5. *Regulations.*—(1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance.

(2) *Schedule.*—The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established

without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any licence granted under this Ordinance, he may grant a search warrant to any superior Officer of Police named in the warrant, and a warrant so granted shall authorise the Officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to be used or intended to be used for wireless telegraphy therein.

7. *Penalties.*—Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

8. *Repeal* No. 22 of 1903, No. 19 of 1912.—The Wireless Telegraphy Ordinance, 1903, and the Wireless Telegraphy Amendment Ordinance 1912, are hereby repealed.

SCHEDULE—SECTION 5 (2).

REGULATIONS.

B 1. All apparatus for Wireless Telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations, "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Passed in the Legislative Council this twenty-third day of May in the year of our Lord, one thousand nine hundred and thirteen.

REGULATIONS (No. 1 OF 1919)

MADE UNDER SUB-SECTION (1) OF SECTION 5 OF THE WIRELESS TELEGRAPHY ORDINANCE, 1913 (No. 11 OF 1913).

C Whereas by sub-section (1) of section 5 of the Wireless Telegraphy Ordinance, 1913 (No. 11 of 1913), it is provided that the Governor may from time to time make regulations for carrying into effect the purposes of the Ordinance:

And whereas by sub-section (2) of section 5 it is provided that the regulations made and passed by the Legislative Council, 23rd day of May, 1913, shall have effect except in so far as they shall be amended or rescinded by regulations made under the authority of the section:

And whereas by regulations made the 16th day of July, 1917, certain of the above recited regulations were rescinded and other regulations were substituted therefor:

And whereas I am minded to make other provision in lieu of the last above recited regulations:

Now, therefore, under and by virtue of the power and authority in that behalf vested in me it is ordered that the regulations made the 16th day of July, 1917, are hereby rescinded and the following substituted therefor:—

1. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

2. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made this 12th day of May, 1919.

SOLOMON ISLANDS AND NEW GUINEA (BRITISH)

(See Maps 22, 54 and 56).

(Including: Papua, New Britain, New Ireland, the Admiralty Islands, Nauru Islands, Kaiser Wilhelm's Land and Bismarck Archipelago.)

NEW GUINEA.—The wireless stations in this territory are operated and controlled by Amalgamated Wireless (Australasia), Ltd. The Regulations of the Australian Commonwealth regarding ships and traffic apply.

BRITISH SOLOMON ISLANDS.—Comprise numerous islands of which the principal ones are Guadalcanar, Malaita, Bogotu (Ysabel), New Georgia, Rendova, Florida, Chouseul, Vella Lavella, Shortland Group, Santa Cruz

Group and Tulagi. All other islands in the Solomon Group from and including Bougainville northward are late German Solomon Islands and are now included in the New Guinea mandated territory.

The Laws and Regulations are the same as those in force for the Fiji Islands.

Capt. R. R. Kane is the Resident Commissioner, and the official stations are operated by the Australian Government.

There is a private commercial station at Rovina (S.W. corner of New Georgia) owned and operated by the Methodist Missionary Society of New Zealand.

SOUTH AFRICA (UNION OF).

(See Maps 25 and 32)

Including: Provinces of Natal, Zululand, Transvaal, Orange Free State and territory of South-West Africa.

CONTROL.

THE administration of radiotelegraphy is in the hands of the Postmaster-General and is not treated as a separate unit.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Lt.-Col. E. A. Sturman, C.B.E.	Postmaster-General	Pretoria
Major R. T. McArthur, D.S.O.	Chief Engineer	Pretoria.

There are no privately owned stations, but licences are issued for private wireless telegraph stations.

The latest available statistics are as follows:—

Land stations for public service to ships	5
Ship stations on privately owned vessels	6
Ship stations on railway owned vessels	3

An agreement has been entered into between the Government and the Marconi Company for the erection, under licence, of a powerful radio station capable of communicating with England. The terms of the licence are for either the taking over by the Government or the renewal of the licence every ten years.

The station when completed will be about twice as powerful as that of Saint Assise, near Paris.

ADMINISTRATION.

The only statutory regulation on radiotelegraphy within the Union is that contained in the preamble to the Post Office Act, and section 80 *ibid.*, both of which will be found below.

There is no Union Act compelling ships trading in South African waters to be fitted with radiotelegraphic apparatus.

A—Statutory Regulation (Preamble to P.O. Act, 1911).

B—Section 80 of Post Office Act, 1911.

C—Regulation relating to Broadcasting and Experimental Stations.

D—Private Wireless Licence Conditions (Govt. Notice 1027 of 1924).

E—Licence to establish a Wireless Receiving Station, and Listener's Contract with Broadcaster.

F—Experimental Transmitting Licence and Contract with Broadcaster.

POST OFFICE ADMINISTRATION AND SHIPPING COMBINATION DISCOURAGEMENT ACT, 1911.

CHAPTER V.—SECTION I.

A In this Act, unless inconsistent with the context, "telegraph" shall include "telephone," and shall mean any system or means of conveying signs, signals, sounds, or communications, by the agency of electricity, magnetism, electro-magnetism, or by any agency of a like nature, whether with or without the aid of wires, and shall include the system commonly known as wireless telegraphy, or atheric signalling, and any improvements or developments of that system.

"Telegraph line" shall include any apparatus, instrument, pole, mast, standard, wire, pipe, tunnel, pneumatic or other tube, thing, or means whatever, which is or may be used in connection with or for the purpose of sending, transmitting, conveying, or receiving telegraphic signs, signals, sounds, or communications.

1. The Postmaster-General shall have the exclusive privilege of constructing and maintaining telegraph lines and of transmitting telegrams or other communications by telegraph within the Union or the territorial waters thereof and of performing all the incidental services of receiving, collecting, or delivering telegrams or other such communications: Provided that—

(a) The owners of any system of railways may maintain and work for the purposes of any such railway, for the time and to the extent authorised by any law, any telegraph lines constructed in pursuance of rights conferred by that law; and

(b) The Postmaster-General may construct, maintain, or lease telegraph lines for private use or may, by licence, authorise any person to construct, maintain, and work private telegraph lines within the Union or its territorial waters and may prescribe the fees and conditions therefor.

POST OFFICE ADMINISTRATION ACT, 1911.

B 80. (1) The Postmaster-General shall have the exclusive privilege of constructing and maintaining telegraph lines and of transmitting telegrams or other communications by telegraph within the Union or the territorial waters thereof and of performing all the incidental services of receiving, collecting, or delivering telegrams or other such communications: Provided that—

(a) The owners of any system of railways may maintain and work for the purpose of any such railway, for the time and to the extent authorised by any law, any telegraph lines constructed in pursuance of rights conferred by that law: and

(b) The Postmaster-General may construct, maintain or lease telegraph lines for private use or may, by licence, authorise any person to construct, maintain, and work private telegraph lines within the Union or its territorial waters and may prescribe the fees and conditions therefor.

(2) No telegraph line shall be used for the purpose of transmitting or delivering telegrams

for the public except by the authority of the Postmaster-General and upon such terms and conditions as he may prescribe, and the department shall have the right, by means of its officers, of inspecting all offices which are authorised to accept, transmit, or deliver public telegrams.

REGULATION No. 1308, 3rd August, 1923, AS AMENDED BY GOVERNMENT NOTICE No. 1371 OF THE 17TH, AUGUST 1923, AND 2042 OF THE 5TH DECEMBER, 1923, FOR WIRELESS "BROADCASTING" AND AMATEUR WIRELESS EXPERIMENTING MADE BY THE POSTMASTER-GENERAL, WITH THE CONCURRENCE OF THE MINISTER OF POSTS AND TELEGRAPHS, AND APPROVED OF BY HIS ROYAL HIGHNESS THE GOVERNOR-GENERAL, IN TERMS OF SUB-SECTION (4) OF SECTION THREE OF ACT No. 10 OF 1911.

PART I.

The Broadcaster.

C 1. Any person may apply to the Postmaster-General for a licence to establish a service of broadcasting wireless telephony. The Postmaster-General may, in his discretion, issue a licence on such terms and subject to such conditions as he may decide. For the purpose of the following regulations the term "Broadcaster" means any person who has been granted such a licence by the Postmaster-General.

2. The broadcaster shall establish, at his own expense, as soon after his licence is granted as possible, a broadcasting station with machinery of the latest approved type, powerful enough to transmit easily over a distance to be specified in the licence. No other broadcasting licence shall be issued within such distance during the currency of such licence.

3. The broadcaster shall comply with such conditions not in conflict with these regulations as the Postmaster-General may from time to time communicate to him.

4. The licence shall continue in force for a period of five years, and at the end of the fourth year after its issue the broadcaster shall intimate in writing to the Postmaster-General whether he intends to apply for a renewal of the licence. Upon application made not less than three months before the expiry of the licence the Postmaster-General may grant a renewal of it for such period and on such terms and conditions as he may decide, or he may, in his discretion, refuse any such application for renewal.

5. The broadcaster shall carry out a regular service lasting in the total for a period prescribed in the licence, consisting of music, entertainment, instruction, public announcements, or other matter which may be approved by the Postmaster-General.

6. The broadcaster shall, at the request of the Postmaster-General, broadcast matter for public purposes, in addition to the ordinary programme, free of charge, for a total period not exceeding three hours in any week.

7. The broadcaster shall have the right to make contracts with listeners, subject to the maximum payments hereinafter specified, provided that contracts of different lengths may be made with listeners at different distances from the broadcasting station. Such contracts shall

be on a form approved of by the Postmaster-General.

8. The broadcaster shall have the right to hire out receiving sets.

9. The broadcaster shall have the right to make contracts with advertisers to disseminate advertising matter, and make charges therefor, provided that advertisements shall not be broadcasted for more than ten per cent. of the total daily broadcasting time, or more than once per hour, or for more than six minutes continuously in any hour without the written permission of the Postmaster-General.

10. The broadcaster shall keep proper books of accounts concerning all capital operating and maintenance expenditure of the broadcasting system showing the net profits after allowing for interest on capital expended, sinking fund, and depreciation of the plant, taking into account obsolescence. Such books shall be open for inspection by any officer authorised by the Postmaster-General at any reasonable time.

11. The broadcaster shall not broadcast any news but purely local news or information in the nature of local news, except such as is referred to in regulation No. 6, unless obtained from or authorised under agreement with the publisher of a newspaper or newsagency.

PART 2.

The Listener.

12. For the purpose of these regulations, the "Listener" is any person located within the specified distance of a Broadcasting Station who has obtained from the Postmaster-General a licence to install a receiving set.

13. A person who desires to become a listener may make application to the broadcaster for a contract, subject to payment to the broadcaster of charges per receiving set not exceeding the following, to be paid annually in advance:—

For service to—

Private residences	£2 0 0
Boarding establishments	3 0 0
Cafés, restaurants, or hotels not licensed for sale of liquor ..	4 0 0
Hotels and other premises licensed for the sale of liquor	6 0 0
For other premises at such charges as the broadcaster, with the approval of the Postmaster-General, may determine.	

The broadcaster shall not be entitled to decline to enter into such a contract with any one unless the Postmaster-General has signified his approval.

14. Contracts for a period exceeding one year, but not exceeding the currency of the broadcaster's licence may be entered into on payment by the listener of a reduced charge.

15. Any type of receiving apparatus may be employed by the listener but no receiving set shall be used unless there has previously been obtained from the Postmaster-General a licence for the use thereof. Such licence shall be obtained upon written application to the Postmaster-General setting forth the particulars of the said contract and the type of the receiving set, and upon payment of the sum of 5s. A licence so issued by the Postmaster-General shall be subject to such conditions as he may deem fit, and shall be available for twelve months from the date of issue, but may at the discretion of the Postmaster-General be renewed on payment of the sum of 5s.

16. The listener shall at the end of the period of any licence either renew the licence within fourteen days or immediately dismantle his

apparatus and give notice in writing thereof to the Postmaster-General.

PART 3.

Amateur Wireless Experimenters.

17. No person shall be entitled to experiment in wireless communications within the distance specified in the licence of any broadcaster without complying with the regulations in this part.

18. Any person, being a British subject, who wishes to experiment in wireless communications within the said distance (hereinafter called an "experimenter") may enter into a contract with a broadcaster and pay him such charges, not exceeding one-third of the ordinary charge made to listeners, as the broadcaster may demand. Such contracts shall be on a form approved by the Postmaster-General.

19. An experimenter desiring to make use of any apparatus for the receiving of wireless communications shall make application to the Postmaster-General for a receiving licence, and shall, when making such application, produce to the satisfaction of the Postmaster-General evidence that he is a *bona fide* student and experimenter in the science of wireless communication. The Postmaster-General may issue such a licence for one year on payment of a fee of 5s.

20. The apparatus for receiving placed in use by an experimenter must be of such a kind that it will not cause waves to be emitted by resonance or otherwise which may interfere in any way with any listener.

21. An experimenter shall not be entitled to transmit wireless messages or waves of any kind whatsoever unless he obtains a transmitting licence under regulations No. 24.

22. An experimenter may, on complying with the regulations in this part, obtain from the Postmaster-General an amateur transmitting licence for one year, subject to the following conditions, and to payment of a fee of 5s.:—

(a) Such licences shall be limited to such a number in any area as the Postmaster-General may decide.

(b) The periods during which the experimenter shall be allowed to operate shall not be more than two per week to be specified in the licence.

(c) The power and wavelengths of the transmission and any other technical conditions shall be laid down in the licence.

(d) The aerial used by any experimenter for transmission shall be:—

(1) Not greater than the following maximum dimensions:—

With a single wire:

Height above ground 40 ft.

Length 60 "

Total length of wire 100 "

With a double wire:

Height above ground 40 "

Length of each wire 70 "

(that is, a total length of wire of 140 ft.)

(2) In such a position that it is easily seen from a public roadway.

(e) No charge may be made by the experimenter for the dissemination of matter of any kind whatsoever.

23. An experimenter may apply for a renewal of his licence before the expiration of the current period, and such renewal for a further period of twelve months may be granted by the Postmaster-General at his discretion and on payment of a fee of 5s. If the experimenter fails to apply for renewal, or if the Postmaster-General declines to renew his licence, the experimenter shall immediately dismantle his wireless apparatus.

24. An experimenter must give ready access to any premises at any reasonable time to any officer authorised by the Postmaster-General for the purpose of examining the wireless apparatus installed by the experimenter.

GENERAL.

25. The licence of any broadcaster may be withdrawn by the Postmaster-General:

(a) If he fails within a period to be determined by the Postmaster-General to commence a broadcasting service which, in the opinion of the Postmaster-General, is adequate;

(b) If, in the opinion of the Postmaster-General, an inadequate service is being given at any time; or

(c) If he ceases to give such service for a period of one week; or

(d) If he continues to broadcast any matter or information of any class which the Postmaster-General considers objectionable, and has requested him not to broadcast; or

(e) If in the opinion of the Postmaster-General the broadcaster has failed to carry out his contract with any listener or experimenter; or

(f) If in the opinion of the Postmaster-General the service is being conducted in an improper manner; or

(g) If the broadcaster contravenes any provision of these regulations or any condition imposed thereunder or any term or condition of his licence.

On the withdrawal of a licence the broadcaster shall cease operations forthwith.

26. The licence of any listener or experimenter may be withdrawn by the Postmaster-General if, in his opinion, it is in the public interest to do so, in which case the listener or experimenter shall immediately dismantle his apparatus, and should he fail to do so any person authorised by the Postmaster-General or the broadcaster may do so, and for that purpose may enter any house or premises.

27. Upon the withdrawal of any licence the licensee shall have no claim for a refund of any fee paid to the Postmaster-General or the broadcaster.

28. These regulations are subject to alteration from time to time provided that no alteration shall be made during the currency of a broadcaster's licence to his financial disadvantage without the broadcaster's consent.

5. State the combined height and length of the proposed aerial, which should not exceed 100 feet for single wire aerial, or 140 feet of wire where two or more wires are used (e.g., total length of 70 feet of double wire).

NOTE.—It is advisable to provide a switch out of doors for earthing the aerial during thunderstorms.

6. Remit a licensing fee of 5s. in the case of either a "listener's" licence of an experimenter's licence for reception only, and a fee of 10s. in the case of an experimenter's licence for transmission and reception. All these fees are payable annually from the date of issue and in advance to the Postmaster-General.

7. The licensed apparatus shall without the consent in writing of the Postmaster-General not be altered or modified in respect of any of the particulars furnished with the application for the licence, nor shall a new apparatus be substituted for the original licensed apparatus.

8. The licensee shall be held responsible at all times for the operation of the licensed apparatus, which, moreover, shall not, without the previous consent in writing of the Postmaster-General, be used by any person on the licensee's behalf or by permission of the licensee for the dispatch or receipt of messages other than messages authorised by the licence.

9. The licensee shall not divulge to any person (other than properly authorised officials of the Government of the Union of South Africa or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

10. The licensee shall not deliver or cause to be delivered to any person any messages received by means of the licensed apparatus, unless the transmission or delivery of such messages has been approved by the Postmaster-General.

11. Except with the consent in writing of the Postmaster-General, the licensee shall not assign, underlet, or otherwise dispose of all or any of the licences, powers, or authorities hereby granted.

12. The licensee shall so work the licensed apparatus as not to interfere with the working of any wireless telegraph station established in the Union or the territorial waters thereof, and the licensee shall comply with all directions which shall be given to the licensee by the Postmaster-General in this behalf.

13. All apparatus used by the licensee shall be so placed and used as not to interfere with the efficient or convenient maintenance, working, or user of any telegraph line of the Postmaster-General, which may from time to time exist.

14. In case any telegraphic line of the Postmaster-General shall be damaged, or the efficient working or user thereof shall be interfered with, and the chief engineer for the time being of the Department of Posts and Telegraphs shall certify in writing under his hand that such damage or interference has been caused by any apparatus used by the licensee, or by anything done by or on behalf of the licensee in relation thereto, the licensee shall on demand pay to the Postmaster-General all costs that shall be reasonably incurred by him in repairing such damage, and in removing or altering such telegraphic line so as to restore the same to efficient working order, and in adding thereto or substituting therefor, either temporarily or permanently, any other telegraphic line if the said chief engineer shall certify that such addition or substitution is reasonably required.

15. For the purpose of this licence the expressions "telegraph" and "telegraph line" shall have the same meaning as in the Post Office

D PRIVATE WIRELESS LICENCE CONDITIONS.
PENALTY FOR UNAUTHORISED STATIONS.

(Government Notice No. 1027 of 1924).

1. Attention is called to the provisions of Section 108 of the Post Office Act (No. 10 of 1911) regarding the serious consequences of erecting telegraph lines (which includes wireless telegraphy) without authority. Under this clause a fine of £5 per day may be inflicted for every day such contravention continues.

A.—REQUIREMENTS TO BE OBSERVED BY ALL APPLICANTS AND/OR LICENSEES.

2. State his full name, age and occupation. If a minor, state the full name of parent or guardian in whose name the licence is to be issued. On attaining the age of twenty-one, applicant will be required to assume sole responsibility under the licence.

3. State the address of the installation.

NOTE.—Any change of address should be promptly notified to the Postmaster-General.

4. Produce two written references from persons of standing not related to him.

Administration and Shipping Combinations Discouragement Act of 1911.

16. The licensee shall afford facility at all reasonable times to duly authorised officers the Postmaster-General to inspect the licensed apparatus, provided that the inspection shall be confined to ensuring that the requirements of the Postmaster-General are reasonably met.

17. This licence may be cancelled by the Postmaster-General at any time at his absolute discretion by specific notice in writing sent by post to the licensee at the address shown hereon, or by means of a general notice in the *Gazette* addressed to all holders of wireless licences, but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained, and the licensee shall not be entitled to any compensation by reason of such determination.

18. The licensee shall at all times indemnify the Postmaster-General against all actions, claims, and demands which may be brought or made by any person in respect of any injury arising from any act licensed or permitted by these presents.

19. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish, erect, extend, maintain, and use any system or systems of telegraphic or telephonic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Government of the Union of South Africa from time to time to enter into agreements for or to grant licences relative to the working and user of telegraphs or telephones (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of South Africa by means of wireless telegraphy or telephony, or by any other means with or to any person or persons whomsoever, upon such terms as it shall in its discretion think fit, and (save as in the licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Post Office Administration and Shipping Combinations Discouragement Act of 1911 and any regulations framed thereunder.

20. If it is desired to maintain the station after the date of expiration, a fresh licence must be taken out within fourteen days.

B.—SPECIAL CONDITIONS IN ADDITION TO THE FOREGOING. EXPERIMENTERS (TRANSMISSION AND RECEPTION).

21. Furnish evidence of competency in the adjustment and operation of a wireless transmitting apparatus.

22. Satisfy the Postmaster-General by means of a full and complete statement of his qualifications and of the nature and object of his experiments, that he has in view some definite object of scientific value or general public utility. If scientific research is intended, he should be certified as a competent investigator by a Government Department or a South African university, etc.

23. Furnish satisfactory evidence of—
His ability both to send and to read by sound Morse signals at a minimum speed of 12 words per minute;

Be willing to undergo an examination, for which a fee of 5s. is charged, should the Postmaster-General consider it necessary.

24. Furnish full particulars and circuit diagrams of his apparatus—

(a) For the transmission of wireless signals. (N.B.—“Spark” transmission is not allowed.);

(b) For the reception of the same.

N.B.—In the case of a purchased set as distinct from a “home-made” set the manufacturers’ full particulars, e.g., maker, number, type of set, will usually suffice, but the Department reserves the right to require a diagram in every case where it seems to be necessary.

Where thermionic valves are to be used, circuit diagrams should always be submitted for examination.

In order to avoid interference with other stations any oscillating valve or valve circuit employing magnetic or electrostatic reaction must not be directly coupled with the aerial. Inductive coupling may be employed between the aerial and a secondary circuit, provided that the receiver is incapable of energising the aerial in such a manner as to cause radiation resulting in interference. Where a separate heterodyne is employed, the oscillator should be coupled with the receiver and not with the aerial circuit.

25. State (a) power (input) to be used for transmission not to exceed 50 watts, and (b) the source of the power. If the power is to be obtained from—

- (1) Batteries, state the kind.
- (2) Secondary cells, state the capacity and maximum discharge rate.
- (3) A motor generator, state the maximum power available.
- (4) Supply mains, state the voltage, whether direct or alternating current, and the periodicity.

26. State the length and character of the waves to be used for transmission (wavelengths not to exceed 200 metres).

N.B.—Means for determining the wavelength must be available at all transmitting stations.

27. Name the stations with which it is desired to exchange signals from the proposed transmitting station, not beyond a radius of ten miles, together with the written consent of the owners thereof, who must necessarily be licensees. Also state on which days and during which hours transmission would take place.

28. The transmitting apparatus shall not be operated during periods other than those specified in the application for the licence.

29. Whenever it is expedient for the public service that the Government of the Union of South Africa shall have control over the transmission of messages by the licensed apparatus, it shall be lawful for the Postmaster-General or the permanent head of Department for Defence by warrant under his hand to cause the licensed apparatus or any part thereof to be taken possession of in the name of His Majesty, and to be used for His Majesty’s service.

30. In the event of the licensee refusing to hand over the said station and appliances on demand the Postmaster-General may immediately thereupon cancel this licence without prejudice to any steps the Governor-General-in-Council may think fit to take to obtain possession of the said station and appliances.

RECEPTION ONLY (LISTENERS OR
EXPERIMENTERS.)

31. Observe requirements in 24 (b) above.

32. The licence granted in respect of any receiving set means that such set complies with the Postmaster-General's requirements, as expressed in the conditions governing the issue of said licence, and implies no guarantee that it will adequately receive broadcasting or any other wireless signals.

FORM OF APPLICATION FOR LICENCE.

I hereby make application for a licence in terms of the foregoing conditions applicable to the same, and by which I promise to abide.

The sum of shillings is enclosed in respect of the licensing fee.

.....
Signature of Applicant.

Date.....

E LICENCE TO ESTABLISH A
WIRELESS RECEIVING
STATION.

Serial No.

Wireless Listener's Contract with the Broadcaster and Licence for Private Wireless Station for Reception only (in terms of the Regulations framed under Government Notice No. 1308 of August 3rd, 1923, as amended by Government Notices Nos. 1371 of August 17th, 1923, and 2042 of December 5th, 1923).

Mr.

is hereby authorised (subject in all respects to the Wireless Broadcasting Regulations and the conditions published in Government Notice No. 1027 of June 18th, 1924, which may be altered, added to, or modified hereafter to meet public interests or requirements or emergencies) to establish a wireless receiving station at

for a period ending on the next.

A receipt for payment of the prescribed fee of 5s. accompanies this licence.

Signature of Licensee.

Postmaster-General.

Dated at Pretoria this day of 192 ..

LISTENER'S CONTRACT.

We being a broadcaster in terms of the aforesaid regulation, hereby acknowledge receipt of the sum of pounds (£) from

of

and we do hereby contract with him as a listener to receive under those regulations the wireless service broadcasted from our station at during a term of one year from the date set forth below.

Signature of Broadcaster.

Dated at on this day of 192 ..

F WIRELESS EXPERIMENTAL
LICENCE.

TRANSMITTING AND RECEIVING.

Whereas by reason of the provisions of the Post Office and Shipping Combinations Discouragement Act, No. 10, of 1911, it is unlawful to establish any wireless telegraph station or instal or work any apparatus for wireless

telegraphy in any place except under and in accordance with a licence granted in that behalf by the Postmaster-General, and it is also unlawful save as in the said Act provided to transmit telegrams within the Union of South Africa:

And whereas

of in the broadcasting area of (herein after called the experimenter) has applied to the Postmaster-General for a licence to establish a system of wireless telegraphy with the sole object of conducting demonstrations or experiments in wireless telegraphy in terms of the regulations for wireless broadcasting framed under Government Notice No. 1308 of August 3rd, 1923, as amended by Government Notice No. 2042 of December 5th, 1923, and the Private Wireless licence conditions specified in Government Notice No. 1027 of June 18th, 1924:

1. It is hereby agreed to issue a licence to the said experimenter to establish and work an experimental wireless transmitting and receiving station subject to the aforementioned regulations and Private Wireless licence conditions, and further that—

(a) The said licensed installation shall be worked solely for the purpose of conducting demonstrations in wireless telegraphy or for conducting experiments for the advancement of science:

(b) The apparatus shall be of the character described or specified in the schedule number one hereto.

(c) Transmission from the said licensed installation shall take place only on the wavelength and at the times specified in the schedule number two hereto.

2. A receipt for the payment of the prescribed fee of 10s. accompanies this licence.

3. Two copies of the licence shall be prepared, one to be retained by the experimenter and one by the Postmaster-General.

4. The experimenter hereby undertakes to enter into a contract with the broadcaster as required by the broadcasting regulations.

Signature of Licensee.

Postmaster-General.

Dated at Pretoria this day of 192 ..

CONTRACT WITH THE BROADCASTER.

We

being a Broadcaster in terms of the Broadcasting Regulations (Government Notice No. 1308 of August 3rd, 1923, as amended by Government Notice No. 1371 of August 17th, 1923, and Government Notice No. 2042 of December 5th, 1923) hereby acknowledge receipt of the sum of

(£ s. d.) under section 20 of the aforesaid regulations from

of

and we do hereby contract with him as an experimenter to receiver under those regulations the wireless service broadcasted from our station at during a term of one year from the date set forth below.

Signature of Broadcaster.

Dated at this day of 192 ..

SCHEDULE No. 1.		SCHEDULE No. 2.	
System of Transmission Employed.	Particulars of Apparatus.	Wavelength to be Employed.	Hours during which transmission is authorised to take place.
Limited to continuous wave and associated methods		Not to exceed 200 metres	

SPAIN

(See Maps 2 and 10).

Including : Canary Islands, Fernando Po, and Spanish Morocco.

CONTROL AND ORGANISATION.

THE Government of Spain, under the rule of King Alfonso XIII, has, since September 13th, 1923, been in the hands of a Military Directory composed of military and naval officers, with Lieut.-General du Miguel Primo de Rivera y Obaneja, Marqués de Estella, as President, who have reorganised the Administration, reduced the expenses, and increased the revenues of the country. Matters relating to Wireless Telegraphy were submitted to a National Conference, and, by a Royal Decree dated June 14th, 1924, the questions considered by this conference were referred to the Technical and Supervisory Board of Radio Communication appointed under a Royal Decree of June 24th, 1924. This board has for its chairman the Chief Official of the Prime Minister's Department, and its members represent the Ministries of State, War, Navy, Interior, Public Instruction, Public Works, and Labour, together with representatives from the Permanent Commission of Electricity and the Laboratory for Wireless Telegraphic Investigation and Research.

From the members of the Board is appointed a permanent committee, with Capt. don José Sastre y de Alba as Secretary, to transact such business as does not require a resolution of the full board. A copy of the Royal Decree of June 15th and the Regulations issued by the National Conference on Wireless Telegraphy are printed below (see K). These Regulations provide for the control of (1) Official Instructional Stations; (2) Experimental Stations; (3) Transmitting and Receiving Stations either wireless or "wired wireless;" (4) Broadcasting Stations (official or private); (5) Amateur Transmitting and Receiving Stations.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Excmo Señor Don Severiano Martínez Anido.	Home Minister	Lisbon, Ministerio de la Gobernacion.
Excmo Señor Duque de Tetuan	War Minister	Francisco Rojas 5.
Excmo Señor Don Honorio Conejo Carvajal.	Naval Minister	Ayala 17.
Ilmo Don José Tafur Funes ..	Director of Posts and Telegraphs	Alberto Aguilera 29.
Ilmo Don Francisco Delmo Flores.	Sub-Director of Telegraphs ..	Bolsa 2.
Ilmo Don Augustin Boyer Granero.	Chief of Radio Service ..	Alcala 133.

The Compañía Nacional de Telegrafia Sin Hilos hold concessions for operating stations for public service and control those at Aranjuez, Barcelona Radio, C. de Palos, C. Finisterre, C. Mayor, Cadiz, Las Palmas, Soller, Tenerife and Vigo.

The Military authorities control the central station at Madrid, and

stations at Almeria, Barcelona, Bilbao, Coruna, Guadalajara, Mahon E.G.I. (Minorca), Malaga, Peñon de Velez, and Valencia in the mother country and neighbouring islands at Alhucema, Cabo Juby, Larache, Melilla and Tetuan in Spanish Morocco and Villa Cisneros in Rio de Oro, besides a number of portable stations.

The Royal Aircraft Service maintains stations at Cuatro Vientos, Getafe, Los Alcazares (Cartagena), Seville, Granada and Nador (Melilla). Other stations will be installed at Alicante and Oran in connection with the air line running through these towns.

The Spanish Navy controls the land stations at Ciudad Lineal (Madrid), La Carraca, Cartagena, Le Ferrol and Mahon (Minorca). Wireless beacons have been installed in the lighthouses at Cabo Villano and Cape Finisterre. Press bulletins are broadcast daily from Cadiz.

During the past year there has been no great movement in the field of Wireless Telegraphy except in the direction of broadcasting, which has developed rapidly.

ADMINISTRATION.

Spain ratified the terms of the International Radiotelegraphic Convention in June, 1913, and is one of the signatories of the Convention on Safety of Life at Sea. Under a Royal Decree dated February, 1917, all merchant ships of 500 tons and over which make long voyages must instal wireless telegraphy.

The following is a summary of the Laws and Regulations now in force, the full text of which is given below :

- A—Law of October 26th, 1907.
- B—General Rules, January 24th, 1908, and July 19th, 1914.
- C—General Regulations for the Working of Wireless Stations, dated January 24th, 1908.
- D—Royal Decree, September 5th, 1914 (Merchant Ships).
- E—Royal Decree, February 20th, 1917 (Compulsory Wireless on Ships of 500 tons and over).
- F—Royal Decree, June 22nd, 1917 (Independent Emergency Sets).
- G—Royal Decree, October 12th, 1917 (supplementing E and F).
- H—Royal Decree, February 8th, 1917 (Regulations for Transmitting and Receiving Stations).
- I—Convention of Madrid, June 17th, 1918, modified June 4th, 1919, concerning wavelengths, etc.
- J—Royal Decree, January 18th, 1920 (Experimental Licences, conditions).
- K—Royal Decree, June 14th, 1924, and Regulations for Official and Private Stations.

LAW OF OCTOBER 26TH, 1907.

THE GOVERNMENT OF SPAIN IS HEREBY AUTHORISED TO ESTABLISH AND DEVELOP THE WIRELESS, CABLE AND TELEPHONE SERVICES.

A H.M. Don Alfonso XIII, by the grace of God and by the Constitution, makes it known by these presents that Parliament has decreed and he, the King, has given his Royal assent to the following :—

ART. 1.—The Government is hereby authorised to establish and develop the wireless, cable and telephone services—availing itself of the co-operation of national institutions—by means of a Royal Order which will be published within four months from the promulgation of this law.

ART. 2.—The expenses entailed by each service will be covered by the takings of the concession itself. In the case of certain concessions, the proviso is reserved that the establishment may be taken over by the State in whole or part, by Royal Decree, should the so doing be considered as in the national interests.

ART. 3.—Concessions regarding these new services will be granted by public tender and all necessary conditions must be fulfilled in order to safeguard the interests and security of the nation.

It is therefore decreed :

That all tribunals, magistrates, prefects, governors and all persons in authority, whether civil, military or ecclesiastical, whatever their rank and dignity, must obey and see to it that this Law is observed in all its parts.

Given at the Royal Palace on October 26th, 1907.

GENERAL RULES.

PROMULGATED BY ROYAL DECREE AS THE BASIS FOR THE ESTABLISHING OF WIRELESS SERVICE IN SPAIN.

B ART. 1.—The establishing and exploitation of all systems and apparatus available for the so-called "Hertzian telegraphy," "etherial telegraphy," and "radiotelegraphy," and all similar processes already invented or which may be

invented in the future, shall be considered as included among the State monopolies regarding all means of electrical communications.

ART. 2.—The establishing and exploitation of the above telegraphic systems shall be controlled by (1) the Minister of the Interior in all matters appertaining to the general civil applications of the said systems, and (2) by the Ministers of War and Marine when and where those applications are specially connected with national defence and with the army and navy.

ART. 3.—All other official departments requiring a radiotelegraphic service can erect wireless installations by previous agreement with the Minister of the Interior. Such installations will be under the regulations established for the regular wireless service and wireless experiments.

ART. 4.—No experiments with the above-mentioned systems can be instituted in the Peninsula, or in the Balearic and Canary Islands, or in Spain's African possessions, without the authority of the Ministers of War, Marine or Interior, according to the kind of experiment which it may be proposed to carry out. Such experiments and trials shall be carried out under the official inspection of the respective departments responsible, excepting only those of a technical character carried out by the personnel of the Scientific institutions of the State. These shall be independent of the said departments, providing they adhere to the regulations laid down.

ART. 5.—The Minister on whose authority the above installations and experiments are established and effected must give notice thereof to the other Ministers, giving them also full particulars regarding their service and conditions.

ART. 6.—Acting in agreement with the Ministers of War and Marine, in the cases herein aforesaid, and acting independently in all other cases, the Minister of the Interior can authorise the installation of wireless stations, provided that none have been officially installed, when the said installations may have been applied for by individuals, societies, corporations or national institutions, subject to the following rules:—

(1) The applicant shall address himself in the first instance to the Minister of the Interior, stating clearly the place where the installation is to be erected, and supplying a plan of the building, together with the conditions and advantages of the locality.

(2) Such installations and the services they are expected to render shall be subject to the special rules and conditions laid down in each case, and to the general regulations established by the State for its own installations and wireless service.

(3) The Government shall have the right to close the service under extraordinary circumstances affecting the safety of the State and the maintenance of public order.

(4) The Government shall also have the right to acquire by purchase, whenever it may be considered convenient, and with the previous payment of an indemnity, the wireless installations hereinbefore mentioned and the valuation for such compensation shall take into consideration the actual condition of the material and of the installation itself.

(5) The concessionaire shall let the Minister of the Interior know, in good time, the date on which the station or stations will start working, in order to allow the personnel of the telegraph office the necessary time for their inspection.

(6) The petitioner must not consider himself entitled to proceed with the work of installation until the necessary authorisation has been granted.

The following rules were added by Decree of July 10th, 1914.

(7) If the stations are to be fitted up merely for the reception of messages and for scientific purposes, or to serve as auxiliaries to meteorological observatories, authorisation for the same can be obtained from the Minister of the Interior, provided that the application be made by an Official Institution or by a private individual acting with the support of an Official Department.

(8) These receiving stations must be inspected by the Director of Telegraphs of the locality where they are installed.

(9) The persons appointed to carry out the reception must take an oath before the Civil Governor of the Provinces, to keep secret all information they may gather from the radiotelegraphic messages.

ART. 7.—The ships belonging to the national mercantile marine can install on board wireless stations worked on any of the wireless systems in current use, provided they obtain a special permit to do so from the Minister of Marine, who will grant it in accordance with the conditions established by the International Agreement and Service Regulations adopted in Berlin on November 3rd, 1906.

ART. 8.—Permits to establish wireless installations will not be granted to any private individual, society, or corporation belonging to a foreign nationality.

ART. 9.—Any person or persons exploiting or using clandestinely any system of wireless, or any person or persons attempting to conduct wireless experiments with apparatus available for the purpose, will be prosecuted in conformity with the Penal Code, the general law, the military orders, or the administrative regulations, as the case may be. Prosecution for these offences will be carried out by the authorities entrusted with the administration of the said laws, orders and regulations; and the State will confiscate all material employed for such purposes.

ART. 10.—By agreement between the Ministers of War, Marine and Interior, the wireless stations which may be considered necessary and convenient for commerce, navigation and national defence will be erected on the seaboard of the Iberian Peninsula, on the Balearic and Canary Islands, and in the African possessions of Spain.

These installations will be under the control of the aforesaid three Ministers, as the case may be, both in the matter of supplies and of personnel and offices, and they will form a part of the national telegraphic system.

This linking up of the wireless with the land telegraphic service will be effected by the ministerial department controlling the various wireless installations.

ART. 11.—Authorisation is hereby given for the interchange of messages between ships belonging to the national mercantile marine and those belonging to foreign nations carrying wireless installations of current systems, and also for the interchange of messages between the said ships and the coast stations already established or to be established by the Ministry of the Interior on the sea board of the Peninsula on the Balearic and Canary Islands, and in the Spanish possessions in Africa.

The Minister of the Interior shall determine the date of the inauguration, the extension and the class of service of each station.

ART. 12.—The Government shall have the option of refusing or accepting those wireless systems the details of which have not been made public.

ART. 13.—The State accepts no responsibility for the wireless service. In the cases of errors or of non-delivery of radiotelegrams the procedure followed will be as established in Art. 35 of the Berlin regulations.

ART. 14.—Whatever the object of the installations, the wireless service shall be organised, whenever possible, in such a way as not to disturb other services of the same kind, or class. The ministerial departments interested shall adopt in each case such rules and regulations as may be found necessary, and shall also arrange regulations with other States regarding frontier installations.

ART. 15.—All wireless services, whether public, official, or private, carried on through the intermediary of land, coast and ship stations, shall be subject to the regulations hereunto attached.

ART. 16.—In addition to the rules herein contained, and those of the regulations mentioned in the previous Article, the provisions affecting Radiotelegraphy contained in the International Convention made in Berlin on November 3rd, 1906, together with the Service Regulations appended thereto, must be observed.

ART. 17.—The Director-General of Posts and Telegraphs shall see to the fulfilment of the stipulations made by Art. 13 of the International Agreement and of those made by Art. 37 of the Berlin Regulations, regarding the International Bureau established in Switzerland. The Ministers of War and Marine shall in accordance thereunto furnish the data required, which must be in the possession of the naval and military installations and stations and also data affecting the merchant ship stations, whose installations are authorised by the Minister of Marine.

ART. 18.—Messages received from or transmitted directly to a country or ship registered in a country which is not a signatory of the convention and regulations of Berlin, can only be admitted through the Spanish telegraphic system and through the coast wireless stations after a declaration has been made by the country in question expressing an intention of applying the rules laid down by the said convention, and their regulations regarding the regular routine of the messages and the security of the accounts. In their radiotelegraphic service the coast stations shall give preference to the service of those countries which have become parties to the international agreements.

Articles 19 to 34 and the additional articles appended thereto deal with wireless installations on fortresses.

REGULATIONS.

GOVERNING THE WORKING OF THE WIRELESS STATIONS IN SPAIN.

GENERAL SERVICE.

C ART. 1.—All persons are allowed to make use of the wireless service, but the Government reserve to themselves the privilege of suspending for an indefinite period, as they may judge convenient, either every class of communication or such communications as belong to some particular class, or communications which affect some special station or stations.

ART. 2.—The following regulations and conditions laid down for the radiotelegraphic service in Spain, besides the provisions

affecting radiotelegraphy contained in the International Convention made in Berlin on November 3rd, 1906, together with the Service Regulations appended thereto, shall be applied to all wireless stations, whether public, official or private, on the coast of the Peninsula, the Balearic and Canary Islands, the African possessions of Spain, and to all ships navigating those territorial waters.

ART. 3.—Ship stations shall be free to select their systems of wireless installation; but for coast stations the administration shall adopt the system and equipment judged to be the best available from the point of view of scientific, technical and economic progress.

ART. 4.—All coast wireless stations shall be linked with the general telegraphic system, by means of private lines, in order to secure rapid communications.

ART. 5.—The working of wireless stations of all classes shall be carried out in such a way that, as far as possible, no disturbance may be occasioned to other stations of the same kind.

ORGANISATION OF WIRELESS STATIONS.

ART. 6.—Wireless stations of all kinds must maintain reciprocal communications with the least possible waste of power.

ART. 7.—Wireless stations in Spain shall use the international signals of the Morse Code for the transmission of messages.

ART. 8.—All wireless installations in Spain including both coast and ship stations, open to the public, must carry on an interchange of messages irrespective of their wireless systems.

During the working hours fixed for each coast station the latter must receive the Morse signals and must also have a transmitter so disposed as to be able to reply in the signals or the same code.

ART. 9.—Coast wireless stations must accept and must give *absolute priority* to calls for help from ships in danger. They must, moreover, answer the said calls in the same order of priority and pass them on as urgent messages to the general telegraphic service.

ART. 10.—The administration shall establish three classes of stations—viz., public, official, and private. Those of the first class must have a radius of 600 kilometres and over, those of the second class one of 400 kilometres (there or thereabout), and those of the third class one of 200 kilometres. Exceptions may be made in accordance with practical experience in working.

ART. 11.—First-class stations shall have three wavelengths at their disposal—namely, one of 300 metres, another of 600 metres, and another which may reach the maximum length, but which must not be less than 1,600 metres. The last two will be used normally. The second and third class stations shall have two wavelengths—namely, one of 300 metres and one of 600; and those of the second class will use normally the 600 metres wavelength, whilst those of the third class will use one of 300 metres, except in the cases referred to in Art. 14 final paragraph.

Coast stations situated near each other may maintain a special service between each other, provided that the distance between them allows of their doing so; but they must give preference to the Maritime Service. In the latter case, and for communications with national vessels on official matters, coast stations of both classes are allowed to use the special wavelengths to which their installations are adapted or adaptable for these services.

ART. 12.—Ships belonging to the Spanish Merchant Service shall use a normal wave-

length of 300 metres, but they can alter this to a maximum of 600 metres.

Only in exceptional cases are vessels of small tonnage allowed to use *normal waves* of less than 300 metres.

ART. 13.—The General Post and Telegraph Office shall publish and keep always up to date a Directory showing the coast and ship wireless stations authorised and open to the public; together with the following information:—

(1) Name and geographical position of the coast station; identification signal in the International Code, and the port of register of the ship fitted with wireless.

(2) Call letters. (These must be all different and must be formed by groups of three letters).

(3) Normal range.

(4) Wireless system adopted.

(5) The class of receiving apparatus whether with automatic call device, etc.

(6) Length of waves used by the station. (The normal wave must appear in italics.)

(7) Class of service rendered by the station.

This covers such items as general communication, restricted communication (*i.e.*, communications with ships, with steamship companies, with ships fitted with apparatus of the same system, etc.); public long distance communications; communications of a private nature; special communications (*e.g.*, those of an exclusively official character), etc.

(8) Hours of service.

(9) Coast and ship station rates.

The Directory above-mentioned shall also include information regarding wireless stations not open to general public service and the existence of which has been made known to the International Bureau by the Spanish Administration.

ART. 14.—Wireless service in coast stations shall be, whenever possible, of a continuous nature, operating both night and day without interruption.

The Post and Telegraph Office shall fix, in each case, the hours of service of those stations where the service is limited.

Coast stations where the service is not of a continuous nature cannot close for the day without having transmitted all radiotelegrams to ships within their sphere of action and without having first received all the radiotelegrams advised by them. This proviso shall also apply in the case of ships signalling their presence before the closing hour of the station.

ART. 15.—Private corporations cannot install ship stations nor can they work any such station without Governmental authorisation. Permits in these cases will be issued in accordance with the provisions of the Berlin Convention and Regulations, by the Ministry of Marine, and will be communicated by the latter to the General Post and Telegraph Office.

Ship stations duly authorised must fulfil the following conditions:—

First.—The system employed must be a tuned system.

Second.—The speed, both for the reception and transmission of messages, must not under normal circumstances be less than twelve words per minute, allowing five letters to the word.

Third.—The power transmitted to the wireless apparatus must under normal circumstances, not exceed one kilowatt. Nevertheless, greater power can be used if the ship is obliged to communicate over a distance exceeding

300 kilometres from the nearest coast station; or, if by reason of any interference, no communication can be established without increasing the power.

The service of the coast and ship stations shall be attended to by operators having their qualifying certificates issued by the General Post and Telegraph Office. This certificate must state the professional knowledge of the operator in the following matters:—

(a) Equipment of the apparatus.

(b) Transmission and reception at a speed of not less than twenty words per minute.

(c) The knowledge of the regulations regarding interchange of wireless communications.

The qualifying certificate must also state that the Government has notified the operator that it is his duty to treat all communications as confidential.

Steamship companies are allowed to employ their own qualified operators provided they fulfil the conditions hereinbefore mentioned.

THE MAKING-OUT AND PRESENTATION OF MESSAGES.

ART. 16.—For the making-out and presentation of radiotelegrams the provisions of Articles 10, 11 and 33 of the Berlin Conference Regulations, in addition to the rules laid down in the following Articles, shall be observed.

ART. 17.—Radiogram forms must have the words Radio Service on the heading.

On the transmission of messages from ship to coast stations no mention will be made of the date and hour of deposit.

On the re-transmission of the telegraph lines the coast stations shall note their own name as that of the station of origin, followed by the name of the ship, and shall register as the hour of transmission the time at which the radio was received by them.

ART. 18.—The instructions for delivery of messages destined for ships at sea must be as complete as possible. The form must be filled up as follows:—

First.—The name of the addresses with additional indications if necessary.

Second.—The ship's name as it appears in the Directory, adding her nationality, and if necessary, as in cases where there are two or more ships of the same name, adding also her identification letters in the International Code.

Third.—The coast station name as it is given in the Directory

ART. 19.—The following messages will not be admitted:—

(1) Reply-paid messages.

(2) Money orders.

(3) Messages to be paid on delivery.

(4) Messages demanding acknowledgment of reception.

(5) Messages to be forwarded.

(6) Messages at special rates, except those for transmission on the telegraphic section or over-land wires.

(7) Messages marked "urgent" except on the over-land wired service, and then only with the reservation that the provisions of the international telegraphic regulations must be applied.

(8) Messages to be forwarded by post or express.

ART. 20.—The messages may be written in plain language or in code in accordance with the interior regulations for ordinary service and with the international conventions on the matter.

ART. 21.—The officials at the stations can ask the senders of wireless messages to prove their identity.

RATES AND EXECUTIVE REGULATIONS.

ART. 22.—In the counting of words in order to apply the rates the officials must follow the provisions of Article 18, 19, and 20 of the International Telegraph Service Regulations as revised in London in 1903.

ART. 23.—In conformity with Article 10 of the Berlin International Convention, the total rate for wireless messages shall include:—

(1) The rate applicable to the maritime section, namely,

(a) the rate in force at the *coast station*.

(b) the rate in force at the *ship station*.

(2) The rate established for the overland wired service, national or international, calculated in accordance with the general rules.

ART. 24.—The rate applicable to the maritime section is hereby fixed at 0.75 pesetas per word, of which 0.45 belongs to the coast station and 0.30 to the ship station.

With regard to the international service, in the case of messages to and from foreign ships, these rates shall be payable in francs, on the same basis.

The rate applicable to the overland wired service, national or international, shall be calculated and allocated in accordance with the interior regulations and with the international regulations.

The minimum rate applicable to the maritime section of wireless messages is hereby fixed at 7.50 pesetas, which is the wireless rate for a radiogram of ten words.

ART. 25.—The coast station* rate will be charged only once, even if the message goes through several coast stations.

ART. 26.—The whole cost of the radiotelegram must be paid by the sender, and at ship stations a tariff indicating this must be displayed.

ART. 27.—For the purposes of book-keeping the coast station must consider itself as addressee with regard to the messages coming from the telegraphic service on their way to ship stations; and the coast station must consider itself as the original office with regard to the messages coming from ship stations for transference to the telegraphic service.

ART. 28.—Coast and ship station rates shall be calculated in accordance with the number of words computed, and in accordance with Article 23 of these Regulations.

ART. 29.—Merchant ships at sea can interchange messages if they find it convenient. The rates to be charged in such cases shall be laid down by the respective owners and shall not be taken into account by the National Administration.

ART. 30.—Ship stations on Spanish vessels shall send to those chartering them, upon their arrival in port, all documents in connection with and referring to all messages exchanged with coast stations. The charterers shall send such documents monthly to the General Post and Telegraph Office, where it will be kept for a minimum period of twelve months and where liquidation of the accounts must be made in due course.

ART. 31.—The installations on Spanish men-of-war shall use, in their communications with the coast stations open to the public, the wavelengths which—under the terms of the Berlin Regulations—may be agreed upon between the Minister of Marine and the Minister of the Interior for the official service.

Both Spanish and foreign men-of-war can exchange private messages with the coast stations or with merchant ships; but only for the benefit of their crews. In such cases the technical and tariff provisions of these Regulations and those of the Berlin Convention and the Berlin International Regulations for the transmission of public correspondence, must be observed, as in the case of a merchant ship station open to the public. The regulations established to prevent the disturbance of wireless communications must be most carefully adhered to.

ART. 32.—When men-of-war exchange messages (private) with coast stations or with other ship installations they must follow the rules established for the computation of words and the collection of rates. In such cases the ship's purser in the Spanish vessels and the Minister of Marine shall respectively exercise similar functions to those assigned to the administration on board, and to the owner as far as merchant ships are concerned.

In the calculation of coast and ship station rates for private service exchanged with foreign men-of-war, the General Post and Telegraph Office shall come to an understanding with the Administration of the country to which the said men-of-war belong.

ART. 33.—The same provisions shall hold good in the case of a military wireless installation, either permanent or portable, when the said installation utilises the stations established by the Administration for Public Service.

ART. 34.—Should, by some accident, the Submarine Cable Service be substituted for the Wireless Service for the sending of a message, the former shall only receive the rate applicable to a coast station. If communication by wireless is established between two points in Spanish territory otherwise without telegraphic communication, the rates charged shall be those of the Interior Telegraphic Service, and the rules of that service shall apply, except in the cases provided for in Article 19 of these Regulations.

ART. 35.—In the matter of transmission of messages, of the signals to be employed in them, orders of transmission, calls, acknowledgments of receipt, instructions as to the route to be followed by the radiograms, and instruction as to their final destination, the provisions made in Articles 15 to 32, both inclusive, of the Berlin Regulations must be observed.

ART. 36.—In cases when the return of charges made for radiotelegrams has been justly established the provisions of Article 35 of the Berlin Regulations must be observed.

BOOK-KEEPING.

ART. 37.—In matters referring to book-keeping for the international wireless service the provisions of Article 36 of the Berlin Regulations must be observed.

GENERAL RULES.

ART. 38.—Coast stations, previously authorised by the General Post and Telegraph Office shall furnish the authorised agents of Maritime Information Bureau with all such particulars concerning wrecks and disasters at sea as are of any interest to navigators, always provided that the said agents apply for such information.

ART. 39.—Authorised interchange of messages between ship stations on the high seas must be carried out in such way as not to disturb the coast station's service. The latter shall have, as a general rule, the right of priority for Public Service.

ART. 40.—The order of transmission between ship stations on the high seas shall be settled by agreement between themselves.

The re-transmission of messages between ships at sea shall be arranged by agreement between the interested parties.

ART. 41.—The provisions of the International Telegraphic Regulations shall be applied by analogy, to radiotelegraphic communication as far as they are not antagonistic to these Regulations, or the Convention, Additional Agreement, and the International Regulations of the Berlin Conference.

ART. 42.—The provisions of Articles 5, 6 and 9 of these Regulations shall apply to all classes of wireless installations, official and authorised, even if they are not open to Public Service.

Madrid, January 24th, 1908.

Approved by His Majesty the King.
—Maura.

(Seal.)

ROYAL DECREE OF SEPTEMBER 4TH, 1914.

ART. 1.—According to the Royal Order of January 25th, 1908, the inspection and regulations of the Wireless Telegraph Service on board vessels of the Mercantile Marine are under the supervision of the Minister of the Navy, and by delegation to the Director-General of Fisheries and Merchant Shipping. The installations should fulfil all the requirements of the said Royal Order together with the rules and regulations of the London Radiotelegraph Convention of June, 1913, and the Rules of the Safety of Life at Sea Convention, January, 1914.

Everything affecting the service shall be controlled by the Navigation Department, which shall attend to the following matters:—

(1) The registration of all new installations authorised.

(2) The forwarding of all documents regarding such new installations accompanied by the order for their recognition.

(3) The sending of a report to the Home Office and War Office as to the result obtained from the various installations, together with indications of their characteristics.

To attend to this service the Director of Navigation and Fisheries will nominate a chief or a superintending official, together with five wireless inspectors on the coast, and this staff must have the qualifications as set forth in the Royal Order of May 21st last.

ART. 2.—The distribution of the staff on the coast and in the maritime provinces under each inspector shall be as follows:—

Barcelona.—Maritime provinces of Barcelona, Tarragona, Valencia, Mallorca, and Minorca (the residence of the inspector being at Barcelona).

Cartagena.—Maritime provinces of Alicante, Cartagena, Almeria, and Malaga, Melilla and Ceuta (the residence of the inspector being at Cartagena).

Cadiz.—Maritime provinces of Cadiz, Canary Islands and Huelva (the residence of the inspector being at Cadiz).

Vigo.—Maritime provinces of Vigo, Pontevedra, Villagarcia and Coruña (the residence of the inspector being at Vigo).

Bilbao.—Maritime provinces of Gijón-Santander, Bilbao and S. Sebastian (the residence of the inspector being at Bilbao).

ART. 3.—The wireless inspectors shall be under the orders of the Commandante de Marina of Districts to which they are attached

and in the ports of which they will have to make their annual inspection. They will only be allowed to leave their habitual place of residence when, for the convenience of the shipbuilders, they have to inspect a station in any other part of their district.

ART. 4.—The wireless inspectors must attend to the following duties:—

(a) To verify and inspect all new installations concerning which they may have been notified by the Director-General of Navigation and Fisheries that they are ready for public service, and to send in a report of the result of their verification and inspection.

(b) To visit annually the installations of such ships as are registered in the ports belonging to the districts within their jurisdiction, and to issue the necessary certificate according to the London Safety of Life at Sea Convention.

(c) To inspect foreign ship stations on board vessels which take passengers in Spain with the object of verifying that they are in possession of the certificate issued under the Safety of Life at Sea, which certificate must have been issued by the maritime authorities of their respective countries.

(d) To report to the Director-General all remarks or complaints made by the ship-owners, crew or passengers in regard to this service so that the aforesaid Director may take such necessary steps as he may think fit.

(e) To see that all the staff that work the installations are in possession of the Government certificate according to the law of January 24th, 1908, with the object of making sure that all these installations are handled by duly qualified operators.

ART. 5.—For these duties a register book will be given to the wireless inspector in which he shall note the following particulars of each visit:—

(a) Date and place of inspection.

(b) Name of the vessel.

(c) System, radius, wavelengths, etc.

(d) Names of operators and dates of their certificates.

A copy of this information is to be sent every quarter to the Director-General in order that he can make out a list and maintain a register devoted to all important information and data.

ART. 6.—The naval and marine authorities will do their best to facilitate the work of the inspector, putting at his disposal the *craft* and *personnel* required by him for the fulfilment of his duties.

ART. 7.—When it is desired to install a wireless station on board a ship, the builder, the owner, the agent or the captain must ask for permission from the Director-General of Navigation and Fisheries. As soon as the installation is completed the applicant must notify the above authority, stating the port in which he desires the visit to be made, so that the wireless inspector may receive instructions accordingly.

ART. 8.—Wireless installations are subdivided into three classes:—

(1) Stations with permanent service.

(2) Stations with limited service.

(3) Stations with special service.

Class 1 includes all vessels which carry twenty-five or more passengers and which have an average speed of fifteen or more knots. This class includes also ships carrying 200 or more passengers, having a speed of over thirteen

knots, and travelling a distance of over 500 miles between two consecutive ports. The latter vessels should carry at least two telegraphists.

To Class 2 belong all the steamers not included in Class 1, provided they are fitted to carry twenty-five passengers or more. During the voyage the ships of this class must have one telegraphist on constant watch during seven hours per day and ten minutes at the beginning of the other hours.

In cases where the vessel is more than 500 miles distant from the nearest coast, the watch must be permanent.

To Class 3 belong all ships which are not included in Classes 1 and 2, and having fifty or more persons on board and carrying less than twenty-five persons or none.

The watch service on these ships must be continuously maintained during a transatlantic voyage or when the ship is over 1,000 miles distant from the coast. In special circumstances, and whenever advisable for the safety of life at sea, ships of every class may be obliged to keep a constant watch.

Vessels belonging to subsidised Government lines are obliged to carry wireless no matter where they sail or what crew they carry.

ART. 9.—The radius of the wireless station shall be a minimum of 100 miles at sea in daytime when communicating with ships under normal conditions and circumstances.

All the stations must be provided with an emergency set, installed on the upper deck, which must be kept in the best condition, having a source independent of the main electric supply and capable of being set in instant working order; this set must be able to work during six hours at least, and must possess a radius of a minimum of eighty miles for ships of the first class and fifty miles for the others.

ART. 10.—When testing the transmission and reception of messages, both installations shall be made to work with a ship at a distance of about 100 miles.

The wavelength and the oscillation current of the aerials must be measured.

When the Director-General thinks it necessary, the curves of resonance will have to be made and the degrees of coupling adjusted. When it is necessary to test the state of the receiving apparatus, the Director may order that one or several of the officers in that service shall make trial tests with the different stations at various distances during the voyage.

ART. 11.—Inspections must be made at the ports of Barcelona, Cartagena, Cadiz, Vigo and Bilbao, which are the places of residence of the wireless inspectors. However, if for the convenience of builders, the inspection should be carried out at some other port, these builders must defray the travelling expenses of the said inspector.

ART. 12.—The radio inspectors shall receive remuneration for all inspections they carry out with regard to wireless installations.

The amount of this remuneration shall be 100 pesetas with an increase of twenty-five pesetas for each auxiliary transmitter which the ship may carry independent of the emergency installation. Such remuneration shall be the same whatever the rank held by the radio inspector.

The annual inspections held for the issue of certificates in accordance with the provisions

of the London Safety of Life at Sea Convention shall be made free of charge.

(Signed) RAMON ESTRADA,

Director-General of Navigation and Marine Fisheries.

Madrid, September 4th, 1914.

ROYAL DECREE DATED

FEBRUARY 20TH, 1917.

Inscribed in the Official Record Under No. 49.

E His Majesty the King (whom God save) inspired by the sentiment of humanity, of which the crews of the merchant ships, which in these difficult times with bravery and with risk to their lives maintain our maritime commerce are deserving, has, in accordance with the proposal of the Director-General of Navigation and Sea Fisheries, designed to decree—

1. All merchant ships of 50 tons and upwards which make long sea voyages or long coasting voyages must carry a wireless installation having a minimum range of 100 miles, as laid down under the International Radiotelegraphic Convention.

2. Similarly the said ships will carry one or more lifeboats in proportion to the number of the crew, each fitted with its own motor, or provided with adjustable motors of such a kind as to answer the same purpose.

3. Local directors of navigation shall allow a certain time for each ship to be provided with these things, the shipowners having to certify before the said authorities that they have taken the necessary steps or made definite contracts to obtain them.

ROYAL DECREE DATED

JUNE 22ND, 1917.

F In view of the request made by the "Cia Nacional de Telegrafia sin Hilos," His Majesty the King (whom God guard) has been pleased to order that all the radiotelegraphic stations concerned in the Royal Decree of Feb. 20th last inscribed in the Official Record under No. 49 shall carry emergency installations in accordance with Article 9 of the regulations for the service of installation and inspection of radiotelegraphy on board merchant ships on September 4th, 1914, excepting those installations which have sources of energy independent of that which forms a regular part of the ship's equipment and is fitted on deck.

Madrid, June 22nd, 1917.

ROYAL DECREE DATED

OCTOBER 12TH, 1917.

Issued in the form of a Circular Published in the Official Gazette of the Spanish Ministry of Marine No. 235 of November 19th, 1917.

G In view of the collection of information by this Administration for the fulfilment of the Royal Orders of February 20th, and June 16th last (inserted in the Official Gazette of this Ministry and numbered 29 and 143 respectively) relative to the complete installation of wireless telegraphs on board merchant vessels of 500 tons and upwards, which are engaged in overseas and extended coasting trade, with a minimum range of 100 miles, on the conditions notified in the regulations governing wireless telegraphy.

And in view of the data recently communicated by the companies "A. E. G. Thomson-

Houston Iberica" and "Nacional de Telegrafia sin Hilos," the former saying that its resources permit the construction of 25 stations per month and that within one year 300 can be provided, whilst the latter give an assurance that they are able to supply wireless stations with the least possible delay, but not defining the duration of this delay.

In resulting from previous communications from this department that there are 57 stations already fitted and arranged for, and that there remain some 80 to be constructed or fitted.

It resulting, moreover, that this Administration deems a delay of eight months to be sufficient for the "Compania Nacional de Telegrafia sin Hilos" to supply these 80 stations, that company being looked upon as a firm reputed in the business world as of good standing and with resources fully equal to those of the "A. E. G. Thomson-Houston Iberica" and the delay of eight months being the double of that within which the latter undertake to fulfil those engagements.

His Majesty the King (whom God guard) in conformity with the information supplied by the Administration, and in agreement with his Privy Council, has thought it well to dispose that, beyond a delay of eight months from the date of publications of this Royal Order, the sailings of the ships mentioned in his Decree of February 20th of the present year shall be stopped if they fail to be fitted with complete wireless stations in accordance with the existing regulations, and that the Marine authorities in the provisions shall carefully communicate this decision to those who appear in their books as proprietors of the respective ships.

ROYAL DECREE OF

FEBRUARY 8TH, 1917.

H ART. 1.—All civil private wireless stations, whether they be transmitting and receiving stations, receiving alone, or assigned for the use of scientific or auxiliary meteorological observatories, are subject to the inspection of the Government, such inspection being carried out by the Home Office and the General Direction of Posts and Telegraphs.

The inspection shall be carried out by telegraph officials, and its object is to promote public order and interest, and protect the rights of the communication monopoly that belong to the State, in fulfilment of the present disposition on the matter and in strict observance of the concession conditions.

In accordance with the rights granted by contract with the State to the "Compania Nacional de Telegrafia sin Hilos," this company can also perform the inspection of the above-mentioned wireless stations at her own expense.

The appointment of inspectors by the company shall be countersigned by the Postmaster-General, and when in performance of their duty will be treated as public officials and be granted the same facilities in the exercise of their duties as those given to the Government inspectors stated in Arts. 3 and 4 of this Royal Decree.

The Home Office shall decide all questions which might arise in the carrying out of this private inspection.

ART. 2.—In addition to the inspection work which the Home Office or the Postmaster-General may at any moment judge convenient to carry out a constant inspection service shall be carried out in the said civil radiotelegraphic stations under the Spanish State authorities.

ART. 3.—To carry out the constant inspection service stated in the preceding article, an inspector for each station shall be appointed by the Postmaster-General, who shall superintend the work, and the station shall not be used even for scientific purposes, except under his personal supervision. The inspector shall adopt such measures as he thinks fit to prevent the station being used during his absence.

When the working of a station cannot be attended to by one official alone, the Postmaster-General may assign two or more inspectors, and distribute between them the work of the station as he may judge convenient.

ART. 4.—Access will be allowed to the inspector of the station at any time of the day or of the night without need of permission, request, or notice of any kind.

For this purpose the keys of the place or places in which the apparatus is installed shall be given to the inspector by the owner or licensee of the station, so that no obstacle or delay may prevent his entrance.

ART. 5.—A weekly report of the general working condition of the station, stating the nature of the service, the day, hour, and minutes when they were effected, and any observation the inspector may judge should be specially noted, should be sent by him to the Telegraph Direction.

Immediate notice shall also be given by the inspector to the General Telegraph Direction of any technical or legal anomaly observed in the working of the station, and the orders of the authority shall be transmitted, executed, or caused to be executed by the said inspector.

ART. 6.—All applications for licence to install a radiotelegraphic station must comply with the following conditions, as well as with all others in force at the time:—

(1) The purpose for which the station is to be employed must be clearly expressed.

(2) A plan of the site where the station is to be installed, its communication with the public street or road, and the places where the apparatus are to be mounted in a 2 per cent. scale, and another plan with diagram of connections and details of aerial in a 10 per cent. scale, shall accompany the request for the licence.

(3) A detailed list of the apparatus specifying their nature, trade mark, and manufacture number (if any), must accompany the application.

(4) The name, age, address, and professional title (if in possession of one) of the operator or operators who will work the station must be stated.

The Home Office Minister can grant or refuse the concession of the licence, and can also modify the technical conditions of the installation before or after the licence has been granted.

ART. 7.—No modification either of the installation or disposition of the station is allowed without authorisation of the Home Office Minister acting on information of the appropriate inspector.

All modifications should be reported to the General Telegraph Direction by the inspector of the station.

ART. 8.—Before a station is opened the proprietor or licensee will deposit a sum of 5,000 pesetas in the general safe of deposits at the disposal of the Postmaster-General, and set aside to cover the pecuniary obligations which the proprietor or licensee might incur.

This sum must be replaced should it diminish or disappear in making good the obligations for which it is set aside.

ART. 9.—The proprietor or licensee must pay all expenses incurred by the final inspection. These expenses comprise a sum which will be fixed by the Postmaster-General, and which must not exceed 2,000 pesetas per annum, to be given to the inspector in monthly payments as a reward for his services, and in payment of all office expenses.

Office accommodation should also be provided for the inspector of the "Compañía Nacional de Telegrafía sin Hilos," should there be one.

Should there be no telegraph office in the place where the station is installed, the proprietor or licensee must provide decent food and lodging for both the official and private inspectors, should there be any.

ART. 10.—The General Direction will classify as major or minor offences any infringements by the proprietor or licensee or any of their staff of this Royal Decree or any other standing orders in this regard.

In all cases the following will be considered as a major offence:—

- (1) Not fulfilling the conditions of the licence.
- (2) Any modification in the installation or arrangement of the station without due authorisation of the Home Office.
- (3) Deliberate obstruction of the inspector with regard to free access to the station under his charge.
- (4) The using of the station for any service without the presence of the inspector.
- (5) Infringement of the terms of Art. 8 of the Royal Decree.

ART. 11.—Apart from other criminal or civil responsibilities involved in the offences enumerated in the preceding article, the following penalties will be exacted:—

- (a) Fine of 100 to 500 pesetas for petty offences.
- (b) Fine of 501 to 2,000 pesetas for serious offences, together with loss of the licence and apparatus. The station will be dismantled at the General Direction of Telegraph's will.

The working of the station may be immediately suspended by the inspector on his discovery of any of the offences enumerated in numbers 1, 2, 3 and 4 of the preceding articles.

ART. 12.—Apart from other criminal responsibilities binding upon the inspector, acts of commission or omission infringing this Royal Decree or any other standing regulations on the matter will be considered as serious offences, and will be punished in accordance with the rules and regulations of the Post and Telegraph Corporation. Should the inspector not belong to the said corporation (*i.e.*, hold the rank of private inspector), the offence will be punished with the fine of 100 to 2,000 pesetas and disability from continuing in his office, the "Compañía Nacional de Telegrafía sin Hilos" being responsible for the payment of the fine.

ART. 13.—Any illicit station discovered shall be immediately dismantled, the General Direction taking possession of all apparatus. The proprietor and any other persons who may be found guilty of installing or working such a station shall, apart from other criminal responsibilities to which they be liable, be punished with a fine of 2,000 to 5,000 pesetas.

The owner of the building, director of the establishment, society, or corporation in whose premises a clandestine station is installed, and who, as soon as it comes to his knowledge, does not report the fact immediately in the

quickest possible way to the General Direction, will incur the same responsibilities.

ART. 14.—Trial for these offences shall be held in public.

An informer shall be entitled to half of the amount of the imposed fine.

ART. 15.—The use of radiotelegraphy granted to official centres for scientific purposes and worked by public officials is not subject to constant inspection, and is excused the deposit referred to in Article 8. The service will not be suspended, nor the apparatus confiscated, should any infringement be committed by the licensee or staff; but the persons guilty of the offence shall be subject to the criminal or civil responsibilities which may personally affect them. A report will be sent in by the Minister of the Home Office to the Minister under whose supervision the station is administered of the offences committed in order to assure the observance of this Royal Decree, and that these offences should be noted in the personal service records.

ART. 16.—The terms of the Royal Decree do not concern the "Compañía Nacional de Telegrafía sin Hilos" (except those which specifically affect this company), and the inspection of these stations will be subject to the conditions of the contract with the State.

ART. 17.—The authorisation for the working of radiotelegraphic stations granted with priority under the Royal Decree must be carried into effect. The General Direction of Telegraphs will immediately organise the constant inspection service for the stations not comprised in Articles 15 and 16.

A term of eight days is granted from the date of publication of this Royal Decree for all private authorised existent stations to send in to the General Direction the information referred to in numbers 2, 3, and 4, of Article 6, and also make the deposit ordered in Article 9. If the term expires before the fulfilment of these obligations, the station will be considered as illicit, and immediate proceedings taken under Article 13, unless the licensee shall present before the expiration of the fixed term a renunciation of his licence to the Minister of the Home Office through the General Direction. He must as a preliminary thereto have dismantled the apparatus.

The same term of eight days is given to those in charge of existing radiotelegraphic stations to hand over to the General Direction the information asked for in numbers 2, 3, and 4 of Article 6. Should the term expire without the fulfilment of these conditions proceedings will be taken according to Article 15.

CONVENTION OF MADRID, DATED JUNE 17TH, 1918, AS MODIFIED BY CONFERENCE OF JUNE 4TH, 1919. CONCERNING WAVELENGTHS TO BE USED BY STATIONS UNDER SPANISH CONTROL.

I. The undersigned have held meetings of a semi-official character in the Ministry of State, Madrid, Spain, on June 12th, 13th, 14th and 15th, 1918, for the purpose of discussing the means for avoiding interference in communications by wireless telegraphy and for the establishment of a programme which shall benefit mutually the radiotelegraph services of the various Governments represented.

2. Attached and below are three annexes marked (A), (B) and (C), in which are contained

the agreements unanimously arrived at by all the representatives present.

Annexe (A) sets forth the agreements adopted.

Annexe (B) contains the organisation proposed in the transmission and reception by wireless telegraphy of the stations of the Spanish Army and Navy.

Annexe (C) includes the organisation proposed in the transmission and reception by wireless telegraphy of the stations of the *Compania Nacional de Telegrafia sin Hilos* and of the Ministry of State.

3. It is understood that all the agreements and arrangements are subject to the approval of the various Governments represented.

Capitan de Fragata,
Representing the Ministry of Marine,

Major R.M.L.I.
English Representative.

Naval Lieutenant,
French Representative.

Captain,
French Representative.

Corvette Captain,
Italian Representative.

Ensign U.S.I.,
Representative of U.S.A.

Director of the Official School of
Telegraphy,
Representing the Ministry of the Interior.

Commander of Engineers and of the
Army.
Representative of the Ministry of War.

Naval Lieutenant,
*Representing the Ministry of State and
of the Compania Nacional sin Hilos.*

ANNEXE (A).

AGREEMENTS ADOPTED.

1. The Agreements of the International Radiotelegraph Convention of July 5th, 1912, will be strictly observed.

2. *Always whenever possible*, communication on a wave of 600 metres will be prohibited.

3. In accordance with the Convention, Spanish merchant ships shall continue to use the 600 metre wave when communicating with commercial coast stations and between themselves.

4. Although War vessels are entitled to use any length of wave whatever, it is agreed for mutual convenience that Spanish war vessels shall not communicate with naval and military stations or between themselves on 600 metres, but with the wavelengths specified in the Annexe (B).

5. It is agreed that inter-communication between Spanish coast stations, whether military, naval or commercial, shall not be made with a 600 metre wave, but with the wavelengths fixed and specified in the Annexes (B) and (C).

6. When a Spanish military, naval or commercial coast station desires to send a message to a Spanish coast station (commercial) which listens-in on a wave of 600 metres, the call will be with a wave of 600 metres and immediately

afterwards they will give each other the conventional signals to change over to the 900 metre wave, and all subsequent communication will take place on that wave.

7. No operator of a coast station or ship station shall listen-in for more than one wavelength during the same period of time.

8. As far as possible, efforts shall be made that Spanish wireless telegraph stations do not interfere with the advices transmitted by coast stations at fixed hours or with the familiar calls for assistance (*llamadas de auxilio*).

The hours at which those advices are transmitted by stations on a wave of 600 metres are at present as follows:—

Station.	Call Signal.	Time (G.M.T.).
Casablanca ..	CNP	0245, 1045, 1845.
Gibraltar ..	BYW	0830, 2030.
Monsanto ..	CTV	0145, 0945, 1345, 2145
Oran ..	FUO	0030, 1400.
Toulon ..	FUT	0930, 2040.

Wavelengths longer than 600 metres, on which the aforementioned advices are transmitted, are not used in the Spanish organisation given in the Annexes (B) and (C).

9. As far as practicable, the wavelengths which have been adopted by all the nations for their press messages will be respected and not interfered with.

No press message shall be transmitted with a 600 metre wave.

10. With the object of obviating interference by the North American, English and French stations with the Spanish stations, the wavelengths selected in the Annexes (B) and (C) will not be changed as far as possible.

11. No call signal or any other working signal shall be made more than three times in each call, and no call signal shall be repeated more than three times in a quarter of an hour. (International Radiotelegraph Convention of London, July 5th, 1912, Articles XXV and XXVI.)

12. All nations represented agree to take the necessary steps to obtain the most exact synchronisation possible at all their stations with a view to ensuring the efficiency of the organisation of wavelengths given in the Annexes (B) and (C), and so that the intermediate wavelengths of 300, 750, 1050, 1350, 1650, 2200, 2750, etc., shall remain free for the use of North American, English and French warships and stations.

13. All communications by wireless telegraphy shall be limited as far as possible.

14. Meetings of a semi-official character will be held in Madrid every six months (June 1st and December 1st) between the representatives of the United States, England, France and Spain, with the object of exchanging impressions regarding:—

- (a) Mutual organisation;
- (b) Means for eliminating interference;
- (c) Change of wavelengths;
- (d) Complaints.

(The particulars contained in Annexes B and C, wavelengths, nature of transmission, etc., may be found by reference to the list of land stations. Call signs and the tabular matter under "Scientific signals.")

ROYAL DECREE OF

18TH JANUARY, 1920.

On wireless telegraph and telephone installations for scientific purposes.

J Wireless telegraph, or telephone, sending and receiving, or only receiving, installations, for scientific purposes, are divided into two classes, viz.: (1) Permanent installations; (2) Provisional installations.

Permanent installations, either for research or as a complement to meteorological observatories, or for any other purpose, will be subjected to the prescriptions of the Royal Decree dated 8th February, 1917.

Provisional installations, or those fitted with the sole object of scientific experimenting or study of any branch of wireless communication, will be permitted by the Home Minister at his discretion for a given time, under the following conditions:—

(1) Applications shall be accompanied by a full report of the experiments and researches which the applicant intends to carry out, showing the place or places destined for these experiments, with diagrams, if possible, of the aerial, transmitting or receiving apparatus and their category and importance.

(2) It must be stated for how long the licence is required in order to carry out experiments and for how many hours per day it is intended to use it.

(3) The installation shall be inspected by an appointed official of the Spanish Telegraphs, and always under the control of the local Chief of the Telegraphs.

(4) As every licence will be issued for a fixed time, at the expiration thereof the installation, comprising aerial and apparatus, shall be dismantled and the matter reported to the Director of Posts and Telegraphs.

(5) Employing the installation for other than experimental and research purposes will entail a fine upon the licensee of pesetas 500 to 2,000, in addition to the confiscation of apparatus and aerial, which shall become the property of the telegraph authorities.

(6) The licensee shall bear all expenses consequent upon the official inspection of this class of installation, in accordance with the stipulations of the Director of Posts and Telegraphs.

(7) Installations licensed for experiments in transmission shall be operated only at the hours and on the wavelength authorised by the Director of Posts and Telegraphs, in order to prevent interference with official and public services.

K ROYAL DECREES.

14TH JUNE, 1924.

Sir,
(1)
H.M. the King (whom God preserve) has thought fit to approve the conclusions submitted by the National Conference on Wireless Telegraphy and to command that the resolutions relative to classification of the services and stations, distribution of wavelengths, radiotelegraphic staff and conduct of radiotelegraphic stations should be referred to the Technical and Supervisory Board of Radio Communications for the drawing up of regulations for the radiotelegraphic service in accordance with the resolutions mentioned.

It is likewise the will of H.M. that the staff of the different Ministries which have formed part of the National Conference on Wireless Telegraphy should be informed of the pleasure with which the

Presidency of the Military Directorate has seen the work carried out by the said Conference.

By Royal Decree I bring the foregoing to the knowledge of your Excellency for your information and subsequent action.

Yours obediently,
PRIMO DE RIVERA,
Madrid, 14th June, 1924.

To the Under-Secretaries of State of all the Ministries.

(2)

Sir,
H.M. the King (whom God preserve) has been pleased to order the following:—

1. That the Regulations for the establishment and conduct of private radioelectric stations, submitted by the National Conference on Wireless Telegraphy should be approved.

2. That the attached Regulations of a provisional nature should be published, and

3. That the Technical and Supervisory Board of Radiocommunications shall bear in mind the various duties assigned to it in the Regulations mentioned.

By Royal Decree I bring the foregoing to the knowledge of your Excellency for your information and subsequent action.

Your obedient servant,
PRIMO DE RIVERA,
Madrid, 14th June, 1924.

To the Under Secretaries of State of all the Ministries and the Chief Clerk in the Chief Government Office.

REGULATIONS.

FOR THE ESTABLISHMENT AND CONTROL OF RADIOELECTRIC AND PRIVATE STATIONS.

CHAPTER I.

Definition and Classification.

ART. 1.—Radioelectric stations (radiotelegraphic or radiotelephonic) may be official or private.

ART. 2.—Official stations are all those which effect a service worked by any Ministry itself direct and also those State stations which have been hired for public services.

ART. 3.—Private radiotelegraph or radiotelephone stations, whether transmitting or receiving, although they may be intended for scientific purposes or as auxiliary stations for teaching centres, are subject to Government supervision. Each Ministry will exercise a constant supervision of its stations and of those auxiliary ones inspected by each Department respectively. Other private and public stations will be inspected by the Ministry of the Interior. These inspections are subordinate to the inspection and intervention of the Technical and Supervisory Board of Radiocommunications, who will carry this out according to the extent and manner it may think most desirable in the interests of the services and National defence.

CHAPTER II.

Transmitting Stations.

ART. 4.—Radioelectric transmitting stations are divided into five classes:—

1. STATIONS FOR INSTRUCTION AT OFFICIAL TEACHING CENTRES.

2. STATIONS FOR TRIALS, EXPERIMENTS OR RESEARCHES BY BODIES OR PERSONS OF SPANISH NATIONALITY.

3. STATIONS FOR ESTABLISHING DIRECT COMMUNICATION BETWEEN TWO OR MORE FIXED OR MOVABLE POINTS BELONGING TO THE SAME PERSON OR BODY.

4. BROADCASTING STATIONS, OFFICIAL OR PRIVATE.

5. AMATEURS' STATIONS.

ART. 5.—STATIONS OF THE FIRST CLASS :
Will be authorised by the Direction-General of Communications upon application by the respective Ministry. They are exempt from payment of royalty of any kind, and as regards the characteristics, it is only stipulated that the aerial shall work in a closed circuit, thus avoiding exterior radiations.

ART. 6.—STATIONS OF THE 2ND CLASS :
Will be authorised by the Direction-General of Communications upon a favourable report from the Technical and Supervisory Board of Radio Communications, who will appoint the days and hours of working and the conditions in each instance. The Direction-General of Communications will forward to the above Board the petition of the applicant which must be accompanied by a memorandum specifying in general terms the nature of the experiments which it is desired to effect, their duration and the plans of the site.

ART. 7.—Experiments or trials must not be made by these installations outside of the limits authorised, both as regards the hours of working and the characteristics of the wave emitted and the power employed.

ART. 8.—The concessionaire shall report on having completed his installation and the latter cannot be put into operation without the previous permission of the official appointed by the Direction-General of Communications who gives an assurance that it complies with the conditions of the authorisation, and, particularly, that its working does not disturb any of the established services.

ART. 9.—When trials have to be carried out by a manufactory of radioelectric apparatus belonging to a Spanish person or body, application for authorisation must be made in the same form as indicated in Art. 6, accompanied also by a voucher from the National Council of Economy certifying that the applicant enjoys the benefits of industrial protection.

In this case the person or body will be exempt from payment of royalty of any kind.

Other installations for experiments, trials or researches shall be charged a monthly royalty of twenty pesetas for every 250 watts measured at the generator.

ART. 10.—Concessions of this class will lapse and will be withdrawn in the following instances :

(a) When the period which was granted terminates and no extension has been obtained.

(b) In the event of non-compliance with any of the conditions established in each case or with any of the general provisions.

(c) When payment of the royalty fixed has not been made.

ART. 11.—STATIONS OF THE THIRD CLASS
Can only be authorised by the Direction-General of Communications to persons or bodies of Spanish Nationality in the same instances as telephonic communication by wire is authorised in accordance with the regulations for telephonic installations. In the event of communication being difficult by wire on account of territorial difficulties or for the purpose of bridging distances licence will also be granted to Municipalities and Deputations.

ART. 12.—These concessions will only be made in cases which are not contrary to others which have been previously granted by the State.

ART. 13.—The power of transmitting stations of this class shall not be greater than what is necessary for bridging the distance separating the points between which communication has to be established.

ART. 14.—These concessions will be granted for a maximum period of five years.

If subsequently the improvements in Radio communication should demonstrate the possibility of communicating by the emission of less energy, the concessionaires shall be obliged when applying for the renewal of the licence to reduce the energy to the limit which may be fixed by the Direction-General of Communications.

ART. 15.—The concession shall be granted for a fixed wave ranging between 240 and 280 metres and the transmitting installation shall be constructed in such a way that the wavelength cannot be varied except between the limits necessary for compensating the accidental variations of the radiation system. Nevertheless when it is a question of special maritime or air services, the wavelengths allocated to those services can also be used.

ART. 16.—In the case of high frequency stations with waves superimposed on wires destined for other purposes, authorisation will not be given for the employment of an energy greater than that which is necessary to establish correct reception. Free choice may be made of the wavelength.

ART. 17.—Stations of this class may not be put into operation without the previous permission of the official appointed by the Direction-General of Communications, so as to guarantee that the installation complies with the conditions of the concession.

ART. 18.—The tax payable in respect of these stations will be for complete years at the rate of two pesetas per watt per year measured at the generator.

ART. 19.—STATIONS OF THE FOURTH CLASS.

These stations may be established freely by private persons or corporations without a concession of any monopoly. The concession shall be for a daily time and a specific power and wavelength.

ART. 20.—Official broadcasting stations may use a power which is adequate for the object proposed, and the wavelength shall be comprised between 1,550 and 1,650 metres; they also have the right to use the power and wavelengths included in the following article for special cases.

ART. 21.—Private broadcasting stations shall have a maximum limit of power of 8 kW. measured at the generator, and the wavelengths shall be comprised between 300 and 440 metres and between 460 and 500 metres.

ART. 22.—To stations of this class shall appertain the transmission of every kind of service of interest or general utility, such as "Official News Bulletin," "Meteorological Bulletin," official Stock Exchange quotations, lectures of social or educative interest, literary articles, musical concerts, press news, articles of industrial propaganda, and anything that may be of a cultural, recreative or moral character or of commercial interest. Concessionaires may devote five minutes at the most to announcements per hour of service, and the State will fix in each case the tax on such publicity.

ART. 23.—Messages addressed to a private person or body having the character of ordinary telegraph or telephone service may not be transmitted.

ART. 24.—Private transmitting stations shall be supervised permanently by an official of the "Cuerpo de Telegrafos."

ART. 25.—Only in special cases will the use of foreign languages be allowed in this service.

ART. 26.—These stations may not be put into operation without the previous permission of an official appointed by the Direction General

of Communications so as to guarantee that they comply with the conditions of the concession.

ART. 27.—The basis of this concession shall be for complete hours, taking as a unit the kilowatt-hour per week; a concession may be granted from a specified day and hour in the week, up to a specified number of hours every day in the week.

ART. 28.—A concession will be granted for the time applied for, which shall not be less than two years nor more than ten.

ART. 29.—When the concession has been granted, the concessionaire must, within a period of eight days, effect a surety at the General Deposit Cash Office of the Ministry of Finance of one thousand pesetas for every kilowatt at the generator (indivisible unit). This surety will be returned after a certificate has been issued by the Direction-General of Communications certifying that the installation has been inspected and approved and has worked satisfactorily for a month.

These concessions may not be transferred.

ART. 20.—The period for executing the installation as from the date on which the concession is notified to the party concerned will be six months. Nevertheless the Direction-General of Communications will have an inspection made after three months in order to ascertain that the work of installation has been effected. In the event of there being no evidence of the existence of preparatory work, the concession will be cancelled in the same manner as if at the end of six months the service had not been inaugurated. In both cases the concessionaire shall lose the surety. The Direction-General of Communications may, in the event of "force majeure" fully justified, grant a single extension of six months.

ART. 31.—As this means of cultural broadcasting is not intended as a privilege, petitions will not be granted, which, by reason of the number of hours applied for on account of the wavelengths desired, might tend to prevent other bodies taking part for the same purpose; one and the same applicant will only be granted the use of one wavelength within the same hour.

ART. 32.—Every concession of a broadcasting transmitting station shall be made on condition that it shall not disturb any established service, especially those connected with aviation in general.

ART. 33.—Concessions of this class will lapse and the apparatus and aërials will be dismantled in the following instances:

(a) When there has been non-compliance with the conditions established in the concession or with the general provisions connected with this class of service.

(b) If at the completion of the period of the concession the extension applied for at least two months before the date of expiry has not been granted.

(c) When without just cause for one month, whether continuously or partially, the concessionaire may have failed to transmit his broadcasting service for a half of the time for which the concession is granted.

ART. 34.—STATIONS OF THE FIFTH CLASS.

Amateurs' stations will be authorised by the Direction-General of Communications subject to the following conditions:—

1. The applicant must possess a 1st or 2nd class radiotelegraphist's certificate, or a 1st class radiotelephonist's certificate, or have some

professional degree, which, in the opinion of the Direction-General of Communications, may entitle him to be responsible for the good working of the station.

2. The petition must be accompanied by plans of the site, and an indication of the object of the installation.

3. The wavelength range for this class is comprised between 0 and 120 metres.

4. The maximum power at the generator admissible is $\frac{1}{2}$ kW., when the proposed installation is more than 50 km. from an official or public radioelectric station. If the distance should be less than 50 km., the primary maximum power is fixed at a 100 watts.

5. Stations of this class are absolutely forbidden to use transmissions for communicating news to third parties, or anything having a character of current telegraph or telephone service.

*6. Whatever modifications it may be desired to make in the installation which might affect the system of radiation, application must be previously made to the Direction-General of Communications, who may authorise them whenever they are not likely to disturb established services.

7. The Direction General of Communications reserves the right to cancel a concession of this class at any time when for technical or Governmental reasons it might be necessary to suppress or modify a station of this class.

8. The State will be paid a royalty of two pesetas per watt per year for these stations, payment being made for complete years on January 1st.

CHAPTER III.

Radioelectric Receiving Stations.

ART. 35.—Authorisation for these stations will be granted to all nationals by the Chief of Telegraphs of the district where they are to be installed, for which purpose there will be provided at all telegraph offices the corresponding Forms 1 and 2.

In the event of there being no telegraph station at the place where the site is, application for a concession shall be made to the provincial Chief of Telegraphs.

ART. 36.—If application for a concession is made by a foreigner the petition will be submitted to the Direction-General of Communications, who will grant it after previously receiving a report from the Ministries of State, War and Navy.

ART. 37.—In the petition particulars must be given of the class of station which is to be installed and the position of the site with sufficient details for ascertaining the disturbances which might be occasioned in the proximity.

ART. 38.—Receiving stations are prohibited from using devices which might set up natural oscillations, capable of disturbing neighbouring stations. The Direction-General of Communications may on its own initiative or by request from outside ascertain whether any receiving station is capable of producing such disturbances and if this should prove to be the case, the party concerned will be advised to make the relevant modification. If after notification there should be a repetition of the disturbances, the concession will be considered as lapsed and the station will be treated as clandestine.

ART. 39.—Licences for the use of a private receiving station shall be charged an annual royalty for complete natural years) of five pesetas, and fifty pesetas whenever they are installed in places of public use, such as cafés, hotels, restaurants, and mercantile enterprises and companies, etc.

ART. 40.—The construction and sale of receiving stations is free.

ART. 41.—Receiving stations may not be used for retransmission by another National transmitting station, without the previous authority of the station of origin.

CHAPTER IV.

Inspection and Sanctions.

ART. 42.—The Technical and Supervisory Board of Radio Communications shall exercise the right of inspection and supervision at all radioelectric stations without exception in the manner it may consider most advisable, all owners of radioelectric stations being obliged to comply with all the provisions prescribed or that may be prescribed, for the purpose of avoiding disturbance of established services, for the maintenance of the secrecy of radiotelegraphic and radio telephonic correspondence that may be received and all other regulative dispositions.

ART. 43.—Steps will be taken in accordance with the Penal Code, with the Military Laws and Ordinances and with the Administrative Regulations, according to the cases and authorisations, for these provisions to be applied against those who attempt to exploit or do exploit abusively or clandestinely, any system of radio communication of whatever class, or against anybody who might effect or attempt to effect clandestinely—transmissions, receptions, trials or experiments of radio communication or of apparatus applicable to it; the State in any case attaching the material that may be used.

ART. 44.—Private transmitting stations may in no case vary the maximum power allowed nor the scale of wavelengths. If the Technical and Supervisory Board of Radio Communications should ascertain that there has been a modification of these characteristics it may impose fines of one hundred to a thousand pesetas for the first time; any repetition of the offence will be a justification for the lapsing of the concession and the attachment of the installations by the State.

ART. 45.—Sanctions shall always be applied against the owner or concessionaire of the radioelectric station, and it will not be possible to allege that the irregularity was committed by another person.

CHAPTER V.

General Provisions.

ART. 46.—In cases of disturbance of public order or for reasons of National Defence, the State reserves the right to attach any authorised private radioelectric station whether transmitting or receiving, whenever it may consider it desirable or necessary for its service. If the attachment should be definite the owner of the station shall be paid its value, after previous expert valuation. If the attachment should be temporary the concessionaire will be exempted from the obligation of paying the royalty during the time the attachment lasts, and the State will compensate the owner, after a previous expert valuation, for the use of the installation.

ART. 47.—If after eight months from the publication of the present Regulation, and the bringing into operation of the broadcasting service in accordance with the standards of liberty established in the foregoing articles, the public need should not be satisfied owing to technical defects or the mediocrity of the programmes transmitted, and if such be stated in writing to the Direction-General of Communications by more than half the holders of licenses for receiving apparatus, and in the event of bodies interested in the construction and sale of radioelectrical material agreeing to associate for the purpose of developing broadcasting in Spain, the State, through the medium of the Direction-General of Communications, will permit the formation of a Consortium to which it would grant the concession of the broadcasting service on the following conditions:—

1. The Consortium shall admit into its Company at any time as many manufacturers or merchants of radiotelephonic goods as may desire to enter it without any privilege to the founders of the Consortium.

2. In the event of the concession being granted to a Consortium a tax will be fixed, in favour of the Consortium, on receivers and on thermionic valves, which shall not exceed 10 per cent. of their invoice value, if the material is of national production, and 25 per cent. if it is of foreign production. Out of the total of these taxes the State will reserve 10 per cent. for itself.

3. There will also be established, in favour of the Consortium an annual fee per receiver, which shall be paid in addition to the licence referred to in Art. 40, and must not be more than double the licence.

4. The whole of the licence royalty accrues to the State.

5. The Consortium shall undertake to erect within the maximum period of a year, at least four stations which satisfactorily cover the area of the Nation, and shall also undertake to give a minimum daily service of three hours.

In the event—according to the opinion of the Technical and Supervisory Board—of the non-fulfilment of these conditions, the concession may then be declared lapsed and the Consortium will lose the stations which will be attached by the State.

6. In exchange for the privilege granted to the Consortium of collecting the taxes, the latter is obliged to transmit free the service entrusted to it by the State.

ART. 48.—On the publication of these Regulations, all stations at present established (private transmitting or receiving stations) are bound to obtain the relevant licence within the maximum period of a month, failing which they will be considered as clandestine.

ART. 49.—All concessions which are applied for, not included in the present Regulations, shall be sent by the Direction-General of Communications to the Technical and Supervisory Board of Radio-communications for the relevant decision.

ART. 50.—When the Technical and Supervisory Board of Radio-communication has ascertained that national production is fully able to satisfy the demands of the Spanish market, it may propose to the Government that steps should be taken to restrict the import of foreign radioelectric material as may be determined by the said Board.

Madrid, 14th June, 1924.

(Sgd.) PRIMO DE RIVERA.

STRAITS SETTLEMENTS.

(See Maps 18 and 22)

Including: Christmas Island, Labuan, Cocos Islands.

THE Crown Colony of the Straits Settlements comprises Singapore, Penang, and Malacca.

The administration is vested in the hands of a Governor, aided by an Executive Council, legislation being under the direction of a Legislative Council, presided over by the Governor.

ORGANISATION.

Commercial wireless telegraph stations have been erected at Paya Lebar, Singapore and Penang, Penang. These installations are Government land stations under the control of the Postmaster-General, Mr. H. C. Sells.

A private wireless station was opened at Christmas Island on June 1st, 1923. This station is owned by Messrs. The Christmas Island Phosphate Company, Ltd.

The Brunei Government opened three small 60 watt C.W. stations in August, 1921, for inland communication at Brunei, Labuan and Temburong, thus placing Brunei in direct telegraphic communication with the outside world.

Wireless telegraphy is a State monopoly, but licences to erect and work stations are issued to private companies or individuals.

ADMINISTRATION.

The administration of wireless telegraphy is regulated by the Ordinance No. 55 (Telegraphs), together with the regulations issued thereunder, which are printed below.

A—Ordinance No. 55, Part V, Wireless Telegraphy.

B—Regulations thereunder.

ORDINANCE No. 55.

PART V.

WIRELESS TELEGRAPHY.

A 33. (1) In this Part the expression "wireless telegraphy" means any system of communication by telegraph, as defined in Part I, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(2) Nothing in this Part shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

34. The Governor may, whenever he deems it expedient to do so, licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony.

35. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony, except under and in accordance with a licence granted by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor in Council determines, and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as the Governor considers desirable in the public interest.

36. (1) Any person who establishes a wireless telegraph station or installs or works any apparatus for wireless telegraphy without a licence shall be liable to a fine not exceeding

one thousand dollars or to imprisonment of either description for a term which may extend to twelve months, and in either case shall be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence.

(2) No proceedings shall be taken against any person under this Part, except with the previous sanction of the Public Prosecutor.

(3) If a Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction, without a licence, he may grant a search warrant to any police officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

37. (1) The Governor in Council may make regulations for,

(a) Prescribing the form and manner in which applications for licences under this Part are to be made;

(b) Prescribing the fees payable on the grant of any licence;

(c) Regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Colony shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as

aforesaid on land and wireless telegraph stations established on ships at sea;

(d) Prohibiting, except with the special or general permission of the Postmaster-General of the Colony, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the Colony.

(e) Prohibiting or regulating, in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Colony, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor sees fit to make and either in all cases or in such cases as are deemed desirable.

(2) No regulations made in respect of the matters described in clauses (c), (d) and (e) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

38. When an applicant for a licence proves to the satisfaction of the Governor that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted, subject to such special terms, conditions and restrictions as the Governor thinks fit, but shall not be subject to any rent or royalty.

39. Every omission or neglect to comply with, and every act done or attempted to be done contrary to this Part or any regulation made thereunder, or in breach of the conditions and restrictions subject to or upon which any licence has been issued, shall be deemed to be an offence against this Part, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine of five hundred dollars.

40. Any convictions, forfeitures and fines under this Part or any regulations made thereunder may be had and recovered before a District Court.

REGULATIONS.

B In exercise of the powers conferred by section 6 of the Wireless Telegraphy Ordinance, 1912, the Governor in Council is pleased to make the following regulations:—

1. All apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Colony shall be worked in such a way as not to interfere with (a) Naval signalling, or (b) the working of any wireless telegraphy station lawfully established, installed, or worked in the Colony or the waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship whether British or foreign shall be worked or used whilst such ship is in any of the harbours of the Colony, except with the special or general permission of the Postmaster-General of the Colony.

3. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy; the use of the wireless telegraphy on board merchant ships whether British or foreign while in the waters of the Colony shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. The Regulations made on the 30th December, 1918, and published as Notification No. 5 in the *Gazette* of the 3rd January, 1919, are hereby cancelled.

E. C. H. WOLFF,
Clerk of Councils.

SUDAN (ANGLO-EGYPTIAN)

(See Maps 25 and 29)

BY a convention between the Egyptian and British Governments, signed at Cairo on January 19th, 1899, the administration of the territory south of the 22nd parallel of N. latitude lies in the hands of a Governor-General appointed by Egypt with the assent of Great Britain. All ordinances, laws and regulations are made by the Governor-General in Council.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. H. Wynne	Director of Posts and Telegraphs	G.P.O., Khartoum
Mr. A. C. Cumming	Chief Engineer, P. & T.	G.P.O., Khartoum
Lieut. R. T. Williams, Royal Corps of Signals	Wireless Engineer	G.P.O., Khartoum
Mr. A. J. Boscott	Assistant Wireless Engineer	G.P.O., Khartoum

ORGANISATION.

The system started with a Coast Station at Port Sudan early in 1915, and has since been extended by the erection of Inland Stations, which provide communication where landlines do not exist, or are liable to interruptions.

Khartoum (S.U.L.) is fitted with a 6-kW. Valve Transmitter, and El Fasher (F.S.R.), Nyala (N.Y.R.), Geneina (G.N.R.), and the Coast Station Port Sudan (S.U.D.), are fitted with 5 kW. Arc Transmitters in addition to the Spark Transmitters. The remaining stations have at present only Spark Transmitters.

No arrangements are yet in force for communication with aircraft or for the transmission of time, weather, hydrographic, press signals, or direction finding.

ADMINISTRATION.

The Regulations affecting Radiotelegraphy in the Sudan are carried out under an Ordinance issued by the Governor-General, and dated at Khartoum, June 4th, 1906. No special regulations have been issued in pursuance of the Ordinance of 1906, and the service is conducted under the Provisions of the International Radiotelegraph Convention, 1912, and the Regulations for its execution. No licences for private wireless stations have hitherto been issued.

A—Wireless Telegraphy Ordinance.

AN ORDINANCE FOR CONSTITUTING WIRELESS TELEGRAPHY A MONOPOLY OF GOVERNMENT.

No. 2 of 1906.

A This Ordinance may be cited as "The Wireless Telegraph Ordinance, 1906."

No person shall install or make use of any apparatus for wireless Telegraphy or transmit or receive messages by means of any such apparatus within the Sudan except the Department of Telegraphs or a duly authorised officer or official of the Sudan Government, unless such person is in possession of a special licence in writing from the Governor-General.

SWEDEN

(See Maps 3, 9 and 16.)

CONTROL.

WIRELESS telegraphy, except in so far as the Navy is concerned, has been placed in the hands of the Kungliga Telegrafstyrelsen, which is a body under the supervision of the Minister of Communications and of which the Radio Bureau forms a special department.

No private companies, societies or individuals are permitted to work wireless telegraphy or erect stations without a concession from the Government.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. S. E. J. Lübeck	Minister of Communications	Stockholm
Mr. Sven Ludvig Herman Rydin	Director-General (Head of the Kungliga Telegrafstyrelsen)	Do.
Mr. S. Ljungqvist	Chief of Radio Bureau	Do.
Mr. A. S. Litström	Inspector of Wireless Installations.. .. .	Do.
Mr. J. G. Holmström	Director of Radiotelegraphic Instruction	Do.

ADMINISTRATION.

Wireless telegraphy and telephony are controlled by the Act of May 16th, 1924, the Royal Decrees of June 20th and July 25th, 1924, and the Statute No. 514 of December 23rd, 1915, concerning the equipment of vessels.

A—Act of May 16th, 1924.

B—Royal Decree, June 20th, 1924 (Receiving Apparatus).

C—Royal Decree, July 25th, 1924 (Wireless on Foreign Vessels).

D—Extract from Statute No. 514 of December 23rd, 1915 (Wireless Compulsory on Certain Vessels).

E—Form of Licence for Ship Stations.

F—(For agreement between Denmark, Norway and Sweden, regarding forwarding of radiotelegrams, see under Norway).

ACT OF 16TH MAY, 1924.

A CONCERNING THE ESTABLISHMENT
AND WORKING OF RADIOTELEGRAPHIC
AND RADIOTELEPHONIC INSTALLATIONS.

GUSTAVE,

*by the Grace of God, King of Sweden of the Goths
and Ventes, make known that, in concert with the
Diet, we have advisedly decreed as follows —*

(1) Radiotelegraphic or radiotelephonic installations which are not used solely for the reception of messages sent out from other installations of the same kind, are styled, in this present Act, "radioelectric installations."

Installations or apparatus used solely for the reception of messages sent out by a radioelectric installation are styled, in this present Act, radioelectric receiving stations.

(2) Anyone wishing to establish a radioelectric installation in Sweden, either on land or on a vessel permanently moored, must apply for an authorisation from the King.

(3) The authorisation of the King must likewise be applied for by anyone wishing to establish a radioelectric installation on board a Swedish vessel not permanently moored.

(4) The authorisations granted by the King under paragraphs (1) and (2) can only be granted for a certain fixed period. In granting the authorisation the King will prescribe, subject to the reservation of private rights, in what manner and under what conditions the installations may be established and worked and will fix the tax payable for the working of the installation.

(5) Anyone establishing or working an installation within the meaning of this Act without the authorisation of the King or contrary to the provisions prescribed in the authorisation, shall be liable to a fine of from 25 to 1,000 kroner if the penalty incurred by this contravention is not already included in the Penal Code.

(6) If a radioelectric installation has been established and worked without the authorisation of the King or contrary to the provisions prescribed at the time of granting the authorisation, or if the authorisation has been subsequently revoked by the King, it is the duty of the Provincial Governors to take the necessary steps to prevent any use of the installation.

(7) Every fine imposed under the present Act will revert to the State. Fines unpaid on account of the insolvency of the delinquents will be commuted by terms of imprisonment, as prescribed by the Penal Code.

(8) The provisions of the present Act do not apply to State installations.

(9) Regulations concerning foreign vessels not permanently moored in Swedish waters which may be deemed necessary for the proper working in Sweden of installations within the meaning of the present Act will be made by the King.

(10) In all matters concerning the right to possess radioelectric receiving stations within Swedish national territory or on Swedish ships not permanently moored and the obligation of owners of such installations to pay the taxes prescribed, the owners must conform with the regulations which may be issued by the King.

The present Act will come into force on the 1st July, 1924. From this date the Act of 31st August, 1907 (No. 94), concerning the establishment and working of radiotelegraphic or radiotelephonic installations will be repealed without prejudice, however, to any authorisation already granted under this previous Act.

Given, etc., at the Palace of Stockholm on May 16th, 1924.

ROYAL DECREE OF 20TH JUNE, 1924.

B REGARDING THE RIGHT TO RETAIN
RADIO RECEIVING APPARATUS.

The Royal Government, in accordance with Article 10 of the Law of 16th May, 1924 (No. 121), concerning the establishment and use of radiotelegraphic or radiotelephonic installations, etc., has found good to make the following decree:—

(1) It is forbidden, without previous authorisation from the Direction General of Telegraphs, to maintain within the limits of the Kingdom an installation or any other device designed for the reception of transmissions sent out by radiotelegraphic or radiotelephonic stations (radio receiving apparatus).

(2) In accordance with the authority quoted in paragraph 1, the Direction General of Telegraphs may prescribe, subject to private rights, in what manner and under what conditions radio receiving apparatus may be maintained and used.

(3) Every owner of such radio receiving apparatus must conform with the restrictions prescribed by decrees of the Royal Government.

(4) Anyone who maintains, without licence, a radio receiver, will be liable to a fine of from 25 to 1,000 crowns, if the offence is not otherwise punishable by penalties already prescribed in the penal law. In the event of the non-observance of the terms prescribed at the time of granting the licence for maintaining radio receiving apparatus, the Direction General of Telegraphs will declare the licence officially cancelled.

(5) In the event of radio receiving apparatus being maintained without a licence, or after cancellation by the Direction General of Telegraphs of the licence previously granted, the Provincial Governors (Konungens befallningshavande) must take all necessary steps to stop the use of such apparatus.

(6) Contraventions provided for under paragraph 4 and in the first clause, will be prosecuted by the public ministry (*Ministère Public*).

Fines imposed under the present decree will revert to the Treasury. In the event of the bankruptcy of the delinquent, these fines may be transmuted in accordance with the provisions of the Penal Code.

(7) The terms of the present Decree are not applicable to radio receiving apparatus belonging to the State, nor to such apparatus installed on board foreign vessels not permanently moored in Swedish territorial waters.

This Decree will come into force on 1st July, 1924. It is, nevertheless, specified that licences previously granted by the Royal Government to own and operate radio receiving apparatus will not lose their validity on account of the present Decree.

Given for the guidance of all concerned. In testimony whereof we have signed the present Decree with our own hand and have confirmed it by affixing our Royal Seal.

Executed at the Castle of Stockholm, the 20th June, 1924.

(Sgd.) GUSTAVE (L. S.)
(Countersigned) SVEN LUBECK,
Minister of Communications.

ROYAL DECREE DATED 25TH JULY, 1924.

C CONCERNING THE USE IN THE
KINGDOM OF RADIOELECTRIC INSTALLATIONS ON BOARD FOREIGN VESSELS.

In virtue of the Law of 16th May, 1924 (No. 121) regarding the establishment and operation of Radiotelegraphic and Radiotelephonic installations. The King has thought good to make the following Decree:—

(i) Radioelectric installations on board foreign vessels not permanently moored in Swedish territorial waters are described, in this ordinance, as Radioelectric Installations on Board Foreign Vessels.

(ii) 1. Radioelectric installations on board foreign vessels may not be used in the neighbourhood of Swedish ports without special licence to this effect granted by the Direction General of Telegraphs acting in concert with the Chief of Naval Staff and subject to a strict observance of the detailed regulations issued by the Direction General of Telegraphs.

2. Within Swedish territorial waters which are less than ten nautical miles from a Swedish coast station, radioelectric installations on board foreign vessels must only be used in cases of distress or to communicate with the nearest coast station.

3. The Direction General of Telegraphs may, with the concurrence of the Chief of the Naval Staff, prohibit or restrain, except in case of distress, the use of radioelectric installations on board foreign vessels in other parts of Swedish territorial waters as well as in those specified in paragraph (2) above.

(iii) The Direction General of Swedish Telegraphs is authorised to issue any regulations it deems fit regarding the putting out of action of radioelectric installations on board foreign vessels within the localities where, under the terms of paragraph (ii) (2), it is forbidden to operate any such installation.

(iv) It is the duty of the Direction General of Telegraphs to bring to the notice of mariners, in the manner it deems most convenient, the regulations and notices issued in the execution of Clause (ii), paragraph 3, and Clause (iii) of this Decree, either once for all or for a certain time or for each particular case; it is also the duty of the said Direction to urge upon the Pilotage Administration, the Direction General of Customs, and the Departmental Authorities concerned, to insure through the services of their respective subordinates the strict observance of all regulations and notices so issued.

(v) When a radioelectric installation on board a foreign vessel is used within Swedish territorial waters, those interested, in default of regulations to the contrary, must conform with the instructions laid down by the Radiotelegraphic Convention in force with the Service regulations annexed thereto.

(vi) Any contravention of the terms of the present Decree or of the regulations and notices issued by the Direction General of Telegraphs under this same Decree, will be punishable by a fine of from 25 to 1,000 crowns.

(vii) Offences mentioned in Clause (vi) above will be prosecuted by the Public Ministry.

In all that concerns the competent jurisdiction in cases of such offences, the Regulations of Clause 328 of the Maritime Code shall apply.

The fines imposed upon delinquents in these cases will accrue to the Crown. Fines which are unpaid on account of the bankruptcy of the delinquent may be commuted in accordance with the terms of the Penal Code.

(viii) The regulations in Clauses (vi) and (vii) above are not applicable to ships of war.

This Decree shall come into force on 1st August 1924.

In testimony whereof we have signed the present Decree with our own hand and have confirmed it by affixing our Royal Seal.

Given at SÄRÖ the 25th July, 1924.

(Sgd. GUSTAVE (L. S.)

(Countersigned) SVEN LUBECK,
Minister of Communications.

EXTRACT FROM SWEDISH STATUTES, 1915.

No. 514 OF 23RD DECEMBER.

D Fifth Chapter. Equipment of Vessels.

1.—Wireless Telegraph Installation.

ART. 56.

Vessels which must be provided with wireless installation.—Vessels which are used for voyages between different countries or between a country and any of its colonies, possessions or protectorates, shall be equipped with wireless telegraph installation, provided however—

That such installation shall not be required if the vessel has fewer than 50 persons on board or if although the number on board is 50 or over, this is exclusively due to the fact that the master, by reason of sickness among the crew or through other compelling, unforeseen circumstances, has been obliged to supplement the crew, or has saved persons in distress at sea, or by reason of obligation, according to law, has taken with him seamen or other persons;

And that the Board of Trade may, on application, grant exemption from the obligation of having such installation, if the Board, in view of the route or other circumstances concerning the voyage, finds that such installation is not necessary and if such application concerns:—

(a) Vessels which do not go out to a distance of more than 150 nautical miles from the nearest coast;

(b) Vessels which only in exceptional cases and incidentally have 50 persons or more on board for the reason that they take stowers or stowage labourers with them on a certain part of the voyage, and which on the one hand do not sail from one continent to another, and on the other hand are, during the said part of the voyage, between 30° northern and 30° southern latitude; or

(c) Sailing vessels which are of rather primitive construction and which it is practically impossible to equip with wireless installation.

ART. 57.

Concession and classes of vessels.—Concerning H.M.'s permission to carry out such installation as referred to in Art. 56, separate enactments have been issued.

In sanctioning such installation as aforesaid the King will fix the class in which the vessel shall be classified, in accordance with the nature of the attendance of the wireless telegraph station.

ART. 58.

Range of the installation.—The wireless installation shall be sufficiently powerful to be able to transmit in day-time, under normal conditions, signals which can be clearly distinguished at a distance of at least 100 nautical miles from the vessel.

ART. 59.

Spare installation.—Vessels which are to be equipped with wireless installation shall have a spare wireless plant. This shall be placed wholly and entirely in the upper parts of the vessel, as high up as possible, and all its parts shall be fitted up so as to be protected as much as possible.

The spare plant shall have a source of power which is exclusively intended for the spare plant, and which can be brought into action most speedily.

The source of power referred to in the second paragraph of this article shall be capable of acting for at least six hours with a minimum range of 80 nautical miles in the case of vessels for which uninterrupted attendance of the wireless installation shall have been provided, and of 50 nautical miles in the case of any other vessel.

If the main installation meets the requirements of the first and second paragraphs hereof as regards the spare plant the spare installation shall not be required.

LICENCE.

E FORM OF LICENCE FOR SHIP STATIONS.

Delivered in view of the opening of communication of the.....
radiotelegraphic station installed with the permission of the King on (date).....
on board the Swedish vessel
belonging to the Port of

The Royal Administration of Swedish Telegraphs certifies by these presents that as the

result of the inspection instituted to this effect, the radiotelegraphic station above mentioned (system) fulfils the conditions cited in conformity with the regulations of the International Radio-Telegraphic Convention for the "Safety of Life at Sea" actually in force, relative to the station on board the class Stockholm.....(date).....192

The Director-General of Swedish
Telegraphs.

Supplementary inspection made 19.. :

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SWITZERLAND

(See Maps 2, 7 and 8.)

THE Swiss Confederation is made up of the union of twenty-five separate political entities, or republics, organised into twenty-two cantons.

Supreme authority is exercised by the Federal Assembly, which consists of two Councils. Both Chambers unite to elect the Federal Assembly, which wields the supreme authority and higher executive of the Confederation.

CONTROL.

Wireless telegraphy in Switzerland is controlled by the Department of Posts, Telegraphs and Railways, but there is no special branch of the department devoted thereto.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. R. Haab	Head of the Department of Posts, Telegraphs and Railways	Berne
Dr. R. Furrer	Director-General of Post, Telegraphs and Telephones ..	Berne
M. Hauser	Assistant to the Director-General	Berne
A. Muri.	Chef de la Division Technique	Berne
Dr. M. Baur	Chef de la Section "Controle et Comptabilité"	Berne
E. Nussbaum	Chef de la Section "Télégraphs et Radio-communication."	Berne

Wireless telegraphy is a State monopoly, based on the new Federal Law affecting telegraphs and telephones, of October 14th, 1922, of which we print below the apposite clauses.

Licences are, however, granted for receiving stations only, available for a limited period, where these are to be used solely for the reception of time, weather signals, and general and technical instruction, scientific researches, and broadcasting matters. We append the form of such contracts.

In order to carry out a clause of the International Conference of October 25th, 1913, relative to an international time association, and starting with August 1st, 1916, the International Time Signal radiated from the Eiffel Tower is on working days telephonically transmitted by the Telegraph and Telephone Department at Berne to subscribers residing in Switzerland. (See Decree of the Federal Council dated July 21st, 1916.)

The Federal Council, on March 11th 1921, granted a concession to Marconi's Wireless Telegraph Co. to establish and work an up-to-date wire-

less station with valve transmission of 25 kW. This station is worked by the "Marconi Radio Station, S.A.," constituted as a Swiss Société Anonyme for the purpose. The station was opened for international public service on April 12th, 1922, and works at high speed on a wavelength of 3,400.

A second transmitter has been in operation since September 1st, 1924, using the same aerial, and with a wavelength of 5,140 metres.

A broadcasting station with a wavelength of 515 metres has been installed at Zurich-Höngg, whence concerts are transmitted daily.

An aviation station has been installed at Kloten and a new aerodrome station is projected for Bâle.

ADMINISTRATION.

We print below extracts from the Federal Law of October 14th, 1922, which replaced the older law of 1907, and came into force on January 1st, 1924, together with the Decrees and Regulations made under this Law.

A—Extracts from Federal Telegraph and Telephone Law of October 14th, 1922.

B—Federal Decree, December 17th, 1923, putting the above law into force.

C—Regulations relating to the granting of concessions, establishment and use of receiving stations.

D—Regulations. Dimensions and Nature of Aerials.

E—Federal Decree, July 21st, 1916, Telephones, Time Signal Service.

EXTRACT FROM LAW OF OCT. 14TH, 1922.

A REGARDING TELEGRAPHIC AND TELEPHONIC CORRESPONDENCE.

ART. 1. The Administration of Telegraphs, has the exclusive right to establish and exploit sending and receiving installations or installations of any kind used for electrical or radio-electrical transmission of signals, pictures or sound.

ART. 2. (1) The telegraph and telephone rules do not apply to sending and receiving installations which are used for the electrical transmission of signals, pictures and sounds, and—

(a) Which are necessary for the working of railways;

(b) Whose conductors neither cross the Swiss frontier nor encroach either on the public domain or on property not belonging to the owner of the installation;

(c) Which are established by military or public authority for exclusive use in military affairs.

(2) The Federal Council may authorise other exceptions to the telegraph and telephone rules.

ART. 3. The competent authorities may grant concessions for the establishment and exploiting of installations intended for the electrical and radioelectrical transmission of signals, pictures and sounds.

(Art. 4 omitted).

ART. 5. (1) The Federal Council may, when the greater interests of the country necessitate such action, suspend public correspondence or restrict and control the use of installations under the telegraphic administration. It may also take similar steps in the case of installations worked under concessions or of railways using electrical or radioelectrical transmissions of signals, pictures or sound.

(2) Such measures do not admit the right of any claim for indemnity nor for repayment of taxes and dues.

(Articles 6 to 20 (1) omitted. These are mainly concerned with telegraphic routine and charges and with penalties for the infraction of regulations).

ART. 20. (2) A subscriber is forbidden to fit other wires or apparatus to those belonging to the Telegraphic Administration without their consent.

(Articles 21 to 24 and 26 to 41 omitted. These refer mainly to telephone subscribers and penalties for infraction of regulations).

ART. 25. The subscriber is responsible to the Administration of Telegraphs for all damage which has been done by his own fault or by that of a third party to inside installations included under the subscription.

ART. 42. (1) The following offences are punishable either by a fine or by imprisonment for one year or more:—

(a) Establishing, exploiting or using without leave or in a manner contrary to the terms of the licence, sending or receiving installations or installations of any kind which would be subject to a licence and used for the electrical or radioelectrical transmission of signals, pictures or sounds.

(b) Imparting to a third party, without authority from the Administration of Telegraphs, any information regarding signals pictures or communications intercepted by a wireless station.

(c) Accepting remuneration of any kind for the transmission by radiotelegraphy under the terms of the licence of messages of public interest.

(d) *Relates to misuse of land-lines.*

(e) Fitting other apparatus or wires to those belonging to the Federal Administration without their consent.

(2) The use of sending or receiving installations (employed for electrical or radioelectrical transmission of signals, pictures or sounds) for the free transmission of communication which are subject to charges or the unauthorised use of any privilege of exemption from such charges, is punishable by a fine of 3 to 1,000 francs.

(3) The telegraphic or telephonic charges which the accused has endeavoured to avoid must be paid in every case.

(4) The offender is punishable even if the act was committed through negligence.

ART. 43. The punishable offences enumerated in Arts. 39 to 42 as well as the fiscal contraventions punishable by imprisonment, are matters for the federal jurisdiction in accordance with Arts. 125 and onwards, of the Federal Law of 22nd March, 1893, concerning the Federal Judiciary organisation.

ART. 44. Deals with minor offences punishable by fines not exceeding 500 francs which may be imposed by the Postal and Railway Authorities and with the rights of appeal to a competent tribunal.

ART. 45. Federal officials and employees, as well as the police authorities of the cantons, must co-operate in the detection and prosecution of punishable offences specified under the present law. The competent authority of a canton must stop at once the working of any illicit telegraphy or telephony by removing the means of transmission employed.

ART. 46. The regulations which the execution of the present law will render necessary will be inserted in the Ordinance of Telegraphs and Telephones, which the Federal Council will issue, as well as the detailed regulations. The payments not specified in the law which the Administration of Telegraphs might be called upon to furnish may give place to the collection of dues proportional to these payments.

DECREE OF FEDERAL COUNCIL, DECEMBER 17TH, 1923.

B PUTTING INTO FORCE THE FEDERAL LAW OF OCTOBER 14TH, 1922.

In the session of December 17th, 1923, the Federal Council, in virtue of Art. 49 of the Federal Law, October 14th, 1922, regulating telegraphic and telephonic correspondence, and upon the representation of the Department of Posts and Railways, issues the following Decree:—

(1) The dispositions of the Federal Law of October 14th, 1922, regarding the regulation of telegraphic and telephonic correspondence which, by virtue of the Decree of the Federal Council of January 29th, 1923, was not put in force, will come into force as a law beginning on January 1st 1924.

(2) The executive ordinances II (Ordinances on Telegraphs) and III (Ordinance on Telephones) of the Federal Law of October 14th, 1922, presented by the Department of Posts and Railways are approved.

(3) Until the promulgation of the executive order I (Concessions and General Legal Dispositions), the standing regulations issued by the administration in matters of concessions will remain provisionally in force.

PROVISIONAL REGULATIONS.

C REGARDING THE GRANTING OF LICENCES, THE ESTABLISHMENT, OPERATION AND CANCELLATION OF RADIO RECEIVING INSTALLATIONS, FEES, ETC.

I. Granting of Licences.

ART. 1. Licences may be granted for:—

(a) The establishment and operation of radioelectric stations for reception and transmission, including radioelectric installations of all kinds which are used for the transmission or reception of signals, sounds or pictures, or which can pick up the transmission of signals, sounds or pictures from established installations in-so-far as they are located in the territory of the Confederation or upon Swiss vehicles of any kind.

(b) The establishment of radioelectric receiving stations for professional or commercial use.

ART. 2. (1) The granting of a licence is necessary before any installation work may be commenced. In special cases exceptions to this rule may be authorised.

(2) Application for licences for receiving stations should be addressed to the proper telephone office on the official form. This form, together with the regulations concerning licences may be obtained from any telephone office or rural telephone sub-office upon payment of a fee of 50 cents.

ART. 3. Every licensee must conform at all times with the laws, ordinances and general regulations in force which affect this matter.

ART. 4. (1) The granting of a licence does not give any rights affecting the usage or property of other parties. The licensee must himself obtain the necessary leave from the owners of such property and arrange directly with them any question of indemnity which may arise.

(2) The granting of a licence does not imply any responsibility or obligation on the part of the Telegraph Administration with regard to the licensee or a third party, neither does it confer any privilege as between the licensee and a third party.

ART. 5. Receiving stations under licence are subject to the control of the Administration of Telegraphs. The control of ordinary radioelectric receiving stations installed by private individuals is limited, as a general rule, to the verification of the class of aerial prescribed for installations of weak or strong currents. The right to inspect occasionally the apparatus installed within the house is reserved by the Administration of Telegraphs for their authorised officials.

ART. 6. Licences for radioelectric receiving stations are granted for an indeterminate period.

ART. 7. Licences for radioelectric receiving stations are divided into the following classes:—

Class Ia. Licences for ordinary private receiving stations, with aerials of Class a (see Art. 5 of Annexe), and

Class Ib. Licences for ordinary private receiving stations with aerials of Class b, installed in a private house, and intended for personal use, recreation and instruction such as come within the nature of experiments (private amateur stations, as those in schools, or in establishments of public utility, for the reception of broadcast radio-telephony and time signals), also for radioelectric research in factories and laboratories, and for scientific tests.

Class IIa. Licences for fixed stations, and

Class IIb. Licences for portable stations, for propaganda announcements, and commercial demonstrations and for the installation of radioelectric receiving stations for professional purposes.

Class III. Licences for fixed stations in public places, for recreation and entertainment.

Class IVa. Licences for fixed stations, and

Class IVb. Licences for portable stations installed for the object of obtaining profit (but *lucratis*), (e.g., exhibitions, propaganda, travelling advertisements).

Class Va and Vb. Licences for fixed and portable stations intended for some special purpose (commercial use of broadcast news of general public interest, etc.).

ART. 8. (1) Licences for private receiving stations of Classes Ia and Ib (Art. 7) are, as a rule, granted upon simple written application to citizens of Swiss nationality of good character (*sans casier judiciaire et aux personnes morales*) entered in the commercial register who are

members of a Swiss business firm of which at least four-fifths of the administrative members are Swiss citizens and domiciled in Switzerland.

(2) Applications for licences from persons of foreign nationality for station of Class I, IIa and III, are treated according to the principle of reciprocity.

(3) In the case where the licensee is a minor and where the law does not otherwise prescribe, his parents, guardians or legal tutors are held responsible to the authorities granting the licence and to third parties for the due observance of the terms of the licence.

ART. 9. (1) Licences for fixed receiving stations of Class IVa are only granted to Swiss citizens of good character who fulfil the conditions specified in Art. 8 (1).

(2) Licences for portable receiving stations (Classes IIb and IVb) are only granted to substantial Swiss citizens who will use and operate the apparatus personally and with due regard to their own responsibility and the rights of others.

(3) Licences of Class V for the reception of broadcast news of general public interest for commercial purposes may be granted to Swiss citizens of good character who fulfil the conditions specified in Article 8 (1).

II. Regulations regarding the use of Licensed Receiving Stations.

ART. 10. Every owner of a radioelectric receiving station, as well as every person employed in a licensed transmitting and receiving station, is bound, under his own responsibility, to keep secret radiotelegraphic and radiotelephonic private correspondence and that of the State, Army and Official. It is forbidden to take any note, no matter of what kind, or to make personal use of any kind of radiotelegrams and conversations or radiotelephonic communications of the State, Army, Official or Private individuals, which have been picked up by means of a radioelectric receiving installation.

ART. 11. (1) In the case where radiotelephonic reception of sounds or radiotelegraphic reception of time signals is demonstrated to third parties, the following special provisions must be observed:—

(a) Transmissions of a public character only, such as radio concerts, time signals, radiotelephonic transmissions of news and communications of general public interest may be demonstrated to third parties by means of loud speakers or telephone receivers connected in groups.

(b) In the presence of third parties or on the occasion of public entertainments, the tuning of receiving apparatus to the required transmitting station must be done with the loud speakers or telephone receivers disconnected. This auxiliary apparatus must not be connected to the receiver after the time when the authorised public transmission is finished.

(2) Public demonstration of radiotelegraphic transmission with the exception of time signals, is forbidden, with the exception of the rules prescribed under Art. 10, this regulation is not applicable:—

(a) To advanced colleges where the receiving apparatus is used for instruction.

(b) For receiving stations belonging to amateur wireless societies, in so far as they are used exclusively by the members for the purpose of experiment and study.

(c) For demonstrations conducted by private societies having a scientific or technical character.

ART. 12. (1) Anyone desiring to demonstrate in public the reception of radiotelephonic transmissions or time signals must be a possessor of a licence.

(2) For the temporary removal and use of a licensed station of Class I or IIa for public demonstration of radiotelephonic transmissions and time signals, an application must be previously addressed in good time to the proper telephone office. The permissions are subject to the following charges:—

(a) For public demonstrations of public interest or in aid of charity—2 francs.

(b) For public demonstrations without entrance charge—5 francs.

(c) For public demonstrations with entrance charge or collection—10 francs.

(3) A portion of these charges is set aside for the payment of the costs of Swiss broadcasting.

(4) Public instructional establishments owning a licensed receiving installation are under no obligation to ask such permission, and are not subject to payment of a tax provided that the station is not removed outside the building.

(5) The use of licensed receiving stations of Class IIb and IVb for public demonstrations is regulated by the special conditions contained in the licence.

(6) The provisional aerials necessary for public demonstrations of radiotelegraphic transmissions must be erected outside the range of lines carrying strong or weak current (*see footnote to D*) or of public roads, and must be taken down when the demonstration is finished.

(7) The officials of the Administration of Telegraphs charged with the control must have free access at all times to demonstrations and exhibitions.

ART. 13. (1) Receiving stations with reaction or heterodyne circuits must be so used as not to produce in the aerial any disturbing oscillation. The Administration will not take any responsibility for the regular reception of signals, news and sounds, by private licensed receiving stations. The judicial administration does not undertake the measures necessary for discovering private receiving stations which are causing disturbances.

ART. 14. The use of recording apparatus of all kinds is subject to special authority from the Direction-General of Telegraphs.

III. Fees.

ART. 15. For radioelectric receiving stations the following charges will be made:—

Taxes fixed for examining the application for a licence and the issuing of the licence—

For stations of Class Ia—3 francs.

For stations of other classes—5 francs.

ANNUAL TAXES.

(1) Classes Ia and Ib 10 francs.

Class IIa 20 „

Class IIb 40 „

Class III 60 „

Class IVa 80 „

Class IVb 100 „

and Class V, a minimum of .. 120 „

(2) The annual taxes are payable at the beginning of the year. A part is set aside for the payment of costs of Swiss broadcasting.

(3) Stations with several aerials installed in different places come within the rule for as many installations subject to taxes as there are aerials installed. In special cases, variations may be authorised.

(4) Annual taxes up to 20 francs maximum are calculated quarterly from the date of the granting of the licence. Any part of a quarter begun will be reckoned as a whole quarter.

(5) Annual taxes of more than 20 francs are calculated from the date of the granting of the licence and *pro rata* to the end of the year.

(6) In the case of cancellation of a licence, the annual tax, which is payable in advance, not exceeding 20 francs, will only be reimbursed for the quarters not begun. For annual taxes of greater value, the reimbursement of taxes is calculated *pro rata* from the date of the dismantling of the station.

(7) For licences available for a period of less than three months, the tax is payable for a full quarter.

ART. 16. (1) If a licensed receiving station should be definitely transferred to within the midst of a group of stations or into another system of stations, the proper telephone office which granted the licence must previously be advised in writing.

(2) Definite transference of licensed radio-electric receiving stations are subject to the following taxes:—

I. Stations with frame or inside aerials for transference within the same group of stations (*groupe de reseaux*)—1 franc.

For transference to another group of stations—2 francs.

II. Stations with outside aerials of Class A.

(a) For transference within the same group of stations—2 francs.

(b) For transference to another group of stations—3 francs.

III. Stations with outside aerials, Class B:—

(a) For transference within the same group of stations—4 francs.

(b) For transference to another group of stations—5 francs.

ART. 17. The alteration of aerials without change of the locality where the station is installed is subject to the following taxes:—

(1) Alteration of aerial, Class B, the erection of a new aerial of Class B in place of frame aerial, or an aerial of Class A—4 francs.

(2) Alteration of an aerial of Class A, erection of a new aerial of Class A, in place of a frame or inside aerial, or an aerial of Class III—2 francs.

(3) Simple modifications of the licence (transference into another class, etc.)—1 franc.

ART. 18. (1) Temporary removals for strictly private purposes during holidays, excursions, etc., are not subject to any fees as regards stations with frame aerials or those with provisional outside aerials erected entirely upon private property and outside the neighbourhood of high or low tension lines and which can be re-erected immediately upon return to the place where the station is usually installed.

(2) The licensee must in this case furnish proof at all times that he is the holder of a licence. Upon demand and on payment of a charge of 50 cents he can obtain from the proper telephone office an identification card available for the current year.

(3) Whenever, during his holidays, a licensee wishes to remove his station for a period exceeding eight days, he must give previous notice to the telephone office at the place where his station is usually installed; such notice may be given either verbally or in writing.

IV. Cancellation of a Licence.

ART. 19. (1) The surrender of a licence must be communicated in writing to the proper telephone office. The form of licence and the identification card already held by the licensee must be enclosed with this letter.

(2) Outside aerials should be removed within eight days from the date of cancellation. If on account of atmospheric conditions or for other reasons, it is not possible to do this, the licensee

should communicate with the telephone office as to the means to be adopted to put the aerial out of action.

(3) Aerials put out of action and those which, during the temporary removal of the station, are not in use, must be earthed.

(ANNEXE.)

D REGULATIONS CONCERNING THE ERECTION OF AERIALS.

ART. 1. The erection of aerials licensed for transmission and reception is governed where applicable and in so far as the present rules do not contain any contrary stipulations, by the Federal Laws and Regulations controlling the erection and upkeep of strong and weak current installations. (*See footnote.*)

ART. 2. The regulations prescribed by Art. 17, Clause 4, paragraph 2, of the Federal Law of June 24th, 1902, regarding electric installations of strong and weak current, are not applicable to the erection of aerials; the expense of providing efficient means of protection is entirely at the cost of the licensee.

ART. 3. (1) The erection of aerials over high or low tension lines or upon railway property is forbidden. In special cases the Direction-General of Telegraphs may authorise the crossing above low tension lines by special permission.

(2) The crossing above or running parallel with lines of strong or weak current is only permitted under exceptional circumstances, when no other solution is possible and is subject to the regulations prescribed in paragraph 3 hereunder and in Art. 4.

(3) The Commercial Authorities reserve the right to prohibit the use of public roads or to issue general rules on this subject.

ART. 4. Private radioelectric receiving installations must not interfere with installations of strong or weak current or with the radio-electric transmitting or receiving, Public or military, installations of the State, neither in their present state nor in their working nor in their future development.

ART. 5. (1) Aerials are divided into two classes:—

Class *a*. *Frame Aerials*. Inside aerials and outside aerials not within the proximity of installations of strong or weak currents, or upon private land which is not used as a public way. (These are not subject to the Federal Law regarding electric installations).

Class *b*. Aerials over public roads, streets and squares, or in the proximity of installations of strong or weak current (such aerials are subject to the Federal Law regarding Electric Installations).

(2) An aerial is considered to be outside the range of an electric installation or strong or weak current when, under the most unfavourable conditions (breakage of wire, of stays, etc.)

In these regulations the expression "lines of strong current" (*lignes à courant fort*) is applied to power or lighting lines and the like carrying a current at a pressure which may, under particular circumstances, prove a source of danger to persons or objects.

"Lines of weak current" (*lignes à courant faible*) refer to telegraph and telephone lines and the like which normally do not carry a dangerous current.

"High Tension Lines" (*lignes à haute tension*) imply power or lighting lines in which the pressure exceeds 1,000 volts and "Low Tension Lines" (*lignes à basse tension*) similar lines in which the pressure does not exceed 1,000 volts.

any contact between the aerial wire and such lines of strong or weak current or any mutual disturbance is entirely prevented.

ART. 6. (1) Aerials of Class *b* must, as regards their technical characteristics, conform with the regulations concerning the establishment and maintenance of lines of weak current. They must be properly erected in such a manner as to ensure against the breakage of the wires and points of support.

(2) Subject to the regulations prescribed under Art. 3, paragraphs 1 and 2, the Federal regulations regarding the erection, keeping in parallel and the crossing of lines of weak current with those of strong current, are enforceable by law in the event of the aerial wire coming in contact with lines carrying a strong current.

(3) In the event of aerial wires coming into contact with low tension lines or with other lines carrying small current, the regulations concerning the crossing and running in parallel with *low tension lines* will be enforced in so far as regards the distances to be observed.

(4) The running in parallel in the immediate neighbourhood of lines of weak current must be avoided as far as possible.

(5) Suspending aerials of Class *b* to chimneys or trees is not allowed.

ART. 7. (1) Wherever an aerial wire crosses above a public road and above lines of weak current, also in the case of crossing *below* high tension lines, the co-efficient of fracture of the wire (per mm²) must not be less than:—

73 kg.	for bronze wire	1.5 mm.	in diameter.
62 "	" "	2 "	" "
58 "	" "	3 "	" "
52 "	" "	4 "	" "
41 "	" "	5 "	" "
40 "	" "	6 "	and more in diameter.
40 "	for copper wire	up to 6 mm.	in diameter.
45 "	" "	iron "	6 "
140 "	" "	steel "	6 "

(2) The maximum span and the minimum sag for the different kinds of wire are:—

40 metres	for 1.5 mm. bronze wire	and 46 cm. sag.
45 "	" "	2 " " " " 54 "
50 "	" "	3 " " " " 63 "
70 "	" "	4 " " " " 104 "
90 "	" "	5 " " " " 155 "
25 "	" "	2 " copper " " 30 "
30 "	" "	3 mm hard-drawn copper wire and 38 cm. sag.
50 "	" "	4 " hard-drawn copper wire and 76 cm. sag.
80 "	" "	5 " hard-drawn copper wire and 152 cm. sag.
40 "	" "	3 " iron wire and 44 cm. sag.
50 "	" "	4 " " " 60 "
85 "	" "	5 " " " 132 "
65 "	" "	2 " steel " " 30 "

(3) For aerials of Class *b* only, cable may be used.

ART. 8. (1) Aerials which are not subject to the law concerning electric installations must be regularly protected in the same manner as lines for weak currents (cut-outs for overload and lightning arresters). For aerials which are not subject to the law, the cut-out is not indispensable, but a lightning arrester must be installed. Every aerial must be capable of being connected directly to earth by means of a suitable earthing switch.

(2) Earth connections must be of copper wire at least 3 mm. in diameter and must maintain good contact with the apparatus as well as with the earthplate.

(3) It is forbidden to connect earth wires to

lightning conductors, central-heating flues, or gas pipes.

ART. 9. (1) Particulars of receiving aerials erected outside any building must be given on the form of application for a licence. For aerials of Class *b* a plan of the situation (copied, if possible from the Ordinance Survey) to a scale of 1:500 must be submitted. This plan must show the proposed position of the aerial as well as any crossing or running parallel with lines of strong or weak current.

(2) Upon the request of the applicant this sketch plan may be supplied by the telephone office on payment of a fee of 3 francs.

ART. 10. No work may be begun on erecting an outside aerial of Class *b* until leave has been granted by a recognised official of the Telephone Department. If such aerials are erected without leave or contrary to the instructions given by the officials of the Telegraph Administration, the applicant will be required to carry out at once, and at his own cost, the modifications deemed necessary. The rights under Art. 42 of the law are reserved.

ART. 11. (1) Any subsequent modifications or removal of an outside aerial subject to the legal regulations must be notified to the proper telephone office *before beginning the work*, especially if, after the modifications, the aerial will come under Class *b*. The notice or request should also be accompanied by a plan of the situation on a scale of 1:500 in accordance with Art. 9, par. 1. Upon the request of the licensee the telephone office will hand him back the original plan to allow the said modifications to be inserted. No modification or removal may be done until after inspection on the spot and approval of the scheme by an official of the proper telephone office. The same procedure must be adopted in the case where an aerial of Class *a* is replaced by an outside aerial of Class *b*.

(2) If on account of important modifications or removal an outside aerial of Class *b* is transferred to Class *a*, notice in writing must be given to the telephone office.

ART. 12. (1) Proposals concerning the erection of aerials in places situate outside the scope of the telephone office will be, as a general rule, arranged by the proper official in the course of other service business.

(2) If the applicant wishes his proposal to be immediately examined, he must pay the cost of the journey and the time occupied.

(3) For the examination of a scheme for erecting an aerial of Class *b*, two local visits by a competent official are generally requisite. Any subsequent visit will be charged to the account of the applicant.

FEDERAL DECREE.

The Director-General of Telegraphs.

TELEPHONIC TIME SIGNAL SERVICE.

SECTION A.

Decree of the Federal Council dated

E July 21st, 1916.

The Swiss Federal Council, acting on the suggestion of its Postal and Railway Department, and in view of the Federal decision of March 27th, 1914:—

DECREES

1. That the international radiotelegraphic time signal radiated daily at 10.26 and at 10.30 o'clock (H.E.C.) from the Paris Observatory by the Eiffel Tower Station, shall be—during working days—retransmitted telephonically by the Administration of Swiss Telegraphs and Telephones at Berne.

2. Any regular telephone subscriber may take up a subscription to the telephonic time signal, arranging therefor with his telephone exchange.

3. Subscriptions are monthly or annual, and are valid for the civil month or civil year.

The rates of subscription are:

(a) Fr.2.50 per month, or part of a month.

(b) Fr.25 per year.

For ten months at least they must be paid in advance.

4. Over and above the possibility of regular subscriptions, telephone subscribers may arrange to be supplied with odd time-service messages on such circuits as receive them. Each separate message will be charged for at the rate of 20 centimes, and this fee will be included, with ordinary conversation charges, in the monthly account.

5. The Administrator of Telegraphs and Telephones will accept no responsibility with regard to any irregular working of the Telephonic Time-Signal Service; nevertheless every endeavour will be made to assure and develop the service.

6. If any interruption in telephonic transmission of the time-signal last for more than seven consecutive days, without this arising from any fault on the part of the subscriber, the subscription fee will be refunded proportionately to the duration of the interruption.

7. Every effort shall be made to carry this edict into effect on and from the 1st August, 1916.

The Postal and Railway Department shall take steps to carry this out.

Dated Berne, 21st July, 1916.

SECTION B.

Method of Administration.

1. Every telephone subscriber who desires to subscribe to the Telephonic Time-Signal Service must address a written request to his telephone exchange showing exactly what kind of subscription he desires to take up (see Article 4 of this section, paragraph (a) to (c).)

2. The telephone exchange which receives an application for such a subscription may, under this rule, accede to the application immediately.

On the reception of a first request for a subscription, the Telephone Exchange puts itself immediately in touch either with the Council Station through whose intermediary the time-signal will be sent, or with its own local centre.

3. The originals of all applications for subscriptions must be sent to the Chief Office, through the intermediary of the local centres.

4. (a) The fees for annual subscriptions must be paid in advance for December, together with the half-yearly fees for the ordinary telephone service.

For periods of less than ten months, starting with the first day of the subscription and until the end of the year, the tax is collected on the basis of the tariff applicable to monthly subscriptions.

An annual subscription becomes automatically renewable from year to year, and may be cancelled at any time upon giving eight days' notice. If, however, it has not run for at least ten months, counting from the beginning of the year up to the date of cancellation, the rate of tax applicable is that of a monthly subscription.

(b) Fees for monthly subscriptions for a settled period (temporary subscriptions) are payable in advance, and for the whole duration of the subscription.

In default of advice to the contrary on the part of the subscriber, his subscription is considered as cancelled on the expiry of the agreed period.

(c) Monthly subscriptions of indeterminate duration are renewable automatically month by month. They may be cancelled at the end of a month by notice given at least eight days in advance, the subscriptions being payable monthly and in advance.

(d) Requests for reception of odd time-service messages are only granted in the case of lines of some importance, and on condition that they are made at latest by 10.20 a.m. Applicants are rung up at 10.25 a.m.

Applications are noted by entering the number of the subscriber on tickets specially prepared for this purpose. These tickets serve as the basis for the rendering of accounts.

When it has not been possible to attend to an application, because the subscriber's line was engaged his enquiry is charged as a local conversation. Fees for odd time-signal messages are charged for at the end of each month on the same invoice as conversation charges.

5. Subscription rates and charges made for odd time-signal messages come under subsection 2(c) of the accounts for messages, and must in consequence be entered, duly classified (see Article 4 of section (a) above) on Form No. 600 under "Other Receipts."

6. The commission allowed to exchange proprietors attached to central stations of Class III, and of intermediary stations, who have to co-operate in the telephonic time-service amounts to 25 per cent. on receipts. This commission is taken into consideration when the annual telephone accounts are adjusted.

Time-service communications in transit should be recorded in the same way as ordinary conversation in transit.

7. When the time-signal message is transmitted to an intermediary station linked up with a central station of Class III, the latter has only a right to a commission of 2 cents per communication in transit, and the commission of 25 per cent. on the message is allotted to the proprietor of the intermediary station.

LIECHTENSTEIN

LIECHTENSTEIN, the small but sovereign Principality which lies on the northern slopes of the Rhetian Alps between Switzerland and Austria, is a democratic monarchy. The reigning Prince is Johann II. On October 2nd, 1921, he gave his sanction to a new and modern constitution which was agreed to in the Assembly.

CONTROL AND ORGANISATION.

In 1921 the Swiss League took over the administration of post, telegraph and telephones.

ADMINISTRATION.

The regulations relating to radiotelegraphy and telephony are in the hands of Switzerland, with whom a Convention exists to that effect.

Actually there are no radioelectric installations in the territory, but regulations have been provided for such contingencies. Those found under Switzerland (C and D) are equally applicable to Liechtenstein.

We print below the Convention between the Swiss Federal Council and the Government of Liechtenstein.

CONVENTION.

A Concluded between the Swiss Federal Council and the Government of the Principality of Liechtenstein relating to the exploitation of the postal, telegraphic and telephone services of the Principality of Liechtenstein in the hands of the administration of the Swiss posts and the administration of the Swiss telegraphs and telephones.

Concluded on the 10th of November, 1920.

Brought into operation on the 1st of February, 1921.

THE FEDERAL COUNCIL OF THE SWISS CONFEDERATION.

After having seen and examined the Convention concluded at Berne on the 10th November, 1920, under reservation of ratification, between the plenipotentiary of the Federal Council, in the name of the Swiss Confederation, and that of His Serene Highness, the reigning Prince of the Principality of Liechtenstein, in the name of the Principality, with regard to the exploitation of the postal, telegraphic and telephonic services of the Principality of Liechtenstein in the hands of the administration of Swiss telegraphs and telephones, which Convention was approved by the States Council on the 10th December, 1920, and by the National Council on the 17th day of the same month, and of which the following is the text.

THE GOVERNMENT OF THE PRINCIPALITY OF LIECHTENSTEIN.

After having seen and examined the Convention concluded at Berne on the 10th November, 1920, under reservation of ratification between the plenipotentiary of His Serene Highness, the reigning Prince of the Principality of Liechtenstein, in the name of the Principality and that of the Federal Council, in the name of the Swiss Confederation with regard to the exploitation of the postal, telegraphic and telephonic services of the Principality of Liechtenstein in the hands of the administration of Swiss posts and the administration of the Swiss telegraph and telephones, which Convention was approved by the assembly of Liechtenstein on the 29th of December, 1920, and which runs as follows—

The Swiss Federal Council and His Serene Highness, the reigning Prince of the Principality of Liechtenstein, in the traditional spirit of good neighbours, have resolved to conclude a Convention in order to assure the exploitation of the postal, telegraphic and telephone services of the Principality of Liechtenstein in the hands of the administration of the Swiss posts, telegraphs and telephones, and have appointed their plenipotentiaries to this effect, viz.:—

The Swiss Federal Council, M. Guiseppe Motta (doctor of laws), President of the Swiss Confederation, Chief of Federal Political Department, H.S.H. the reigning Prince of the Principality of Liechtenstein, M. Emile Beck (doctor of laws), Charge d'Affaires of the Principality of Liechtenstein, in Switzerland, who, having presented their full powers, recognised in proper and due form, arranged the following provisions.

CHAPTER I.

GENERAL PROVISIONS.

ART. 1.—The postal service, including the postal cheque service and that of the postal savings bank, as also the telegraphic and telephone services of the Principality of Liechtenstein, are exploited for the Principality by the care of the management of the Swiss posts and the management of the Swiss telegraphs and telephones.

ART. 2.—The Swiss rules and regulations having reference to the postal, telegraphic and telephone service, as well as the agreements and statements concluded between Switzerland and foreign countries, are applicable in the Principality of Liechtenstein in the same way as in Switzerland.

ART. 3.—Inasmuch as their repression is foreseen in the law, the contraventions of the federal fiscal laws are deferred, in the first instance, to the tribunal at Vaduz.

The cantonal tribunal of St. Gall is appointed as a court of appeal, and the federal tribunal at Lausanne as supreme court of appeal.

ART. 4.—(1) The post, telegraph and telephone offices of the Principality of Liechtenstein must be appointed as such, although they depend exclusively upon the administration of the Swiss posts and the administration of the Swiss telegraphs and telephones.

(2) Only the armorial bearings and national colours of the Principality will figure on notices, stamps and official seals of the post, telegraph and telephone offices of the Principality.

(3) The employees of Liechtenstein nationality engaged in the Principality are required to furnish their caps with the Liechtenstein badge, and the wearing of this cap is compulsory.

CHAPTER II.

POSTAGE STAMPS, TAXES AND DUES.

ART. 5.—(1) (Concerning postage stamps.)

(2) (Concerning the sale of postage stamps.)

(3) (Concerning forgeries of postage stamps.)

ART. 6.—(1) The same taxes and dues will be gathered in the postal, telegraphic and telephone traffic between Switzerland and Liechtenstein as in the Swiss interior traffic. In that which concerns the postal, telegraphic and telephone traffic between the Principality of Liechtenstein and abroad the tariffs are the same as those applied by Switzerland in her traffic with abroad.

(2) The right of freedom from tax in the Principality is regulated by the same decrees as in Switzerland.

CHAPTER III.

SERVICE OF OFFICIALS AND EMPLOYEES.

ART. 7.—(1) The officials and employees of the postal, telegraphic and telephone services of the Principality of Liechtenstein are engaged by the administration of the Swiss posts and the administration of the Swiss telegraphs and telephones. The Government of the Principality of Liechtenstein has always the right to make proposals for the definite nomination of officials. Except on account of special reasons

touching on questions of service, these proposals shall be adopted.

(2) Provisionally, and in so far as the necessities of the service exact it, officials and employees of Swiss nationality may be equally employed in the Principality.

ART. 8.—(1) The officials and employees of the postal, telegraphic and telephonic service of the Principality of Liechtenstein have the same rights and duties as the similar staff engaged in Switzerland.

(2) The authorities, tribunals and district presidents of the Principality of Liechtenstein shall assist this staff in the exercise of its duties in the same degree as the similar authorities in Switzerland.

(3) If an enquiry is held on, or a judgment given against, an official or employee of the postal, telegraphic or telephone service of the Principality, the local tribunals are under the obligation of enforcing the authority to which the accused belongs in the same manner as the Swiss tribunals have to do in like case in Switzerland.

CHAPTER IV.

POSTAL ROUNDS AND TECHNICAL INSTALLATIONS.

ART. 9.—The establishment and suppression of post, telegraph and telephone offices, the establishment, modification and suppression of postal rounds, as well as telegraphic and telephonic installations in the Principality of Liechtenstein, can only be ordered after an understanding with the Government of this State. The demands formulated on this subject by the Government of Liechtenstein will be taken into consideration, as far as possible, by the Swiss administration as far as it refers to installations the expenses of which are borne by the same Government.

CHAPTER V.

POSTAL CHEQUE AND POSTAL SAVINGS BANK SERVICES.

ART. 10.—(1) (Concerning the Post Office Savings Bank.)

(2) (Concerning the accounts of the Post Office Savings Bank.)

ART. 11.—(Concerning the investment of funds.)

CHAPTER VI.

OWNERSHIP OF THE FUNDS.

ART. 12.—(1) (Concerning the exploitation of funds.)

(2) (Concerning the exploitation of funds.)

ART. 13.—(1) The equipment of the offices and of the staff, as well as of the telegraphic and telephonic installations necessary to assure the exploitation of the postal, telegraphic and telephone services on the territory of Liechtenstein, are the property of the Principality of Liechtenstein.

(2) All acquisitions and installations effected under the regime of the present Convention are done at the cost of the Principality of Liechtenstein, and become its property.

CHAPTER VII.

SETTLEMENT OF ACCOUNTS.

ART. 14.—(1) The receipts and expenses accounts of the postal service of the one part, and those of the telegraphic and telephone service of the other part are settled separately.

(2) They are made up each month by the Swiss administration concerned, and an abstract is sent to the Government of the Principality of Liechtenstein, which must give its opinion in the course of one month. It is allowed that these monthly accounts can be followed by supplementary abstracts of accounts.

ART. 15.—(1) All expenses incurred by the postal, telegraphic and telephone services of the Principality must pass through the accounts in such a manner that only such sums which have been actually spent are mentioned.

(2) The annual expenses occasioned by the general administration (management, superintendence, auditing of accounts, etc.), as well as the purchase of office stock for current use (forms, etc.), are carried to the debit side of the exploitation account at a round figure corresponding approximately to the needs of Liechtenstein.

ART. 16.—(1) All taxes and dues collected in the postal service by the post offices of Liechtenstein accrue exclusively to the Principality of Liechtenstein; and the sum total of these emoluments must, in consequence, be paid into the credit of the exploitation account. On the other hand, the receipts realised by the Swiss offices and arising from the collection of the same, taxes and dues accrue exclusively to Switzerland, and do not affect the accounts in question.

(2) At the same time, the receipts coming from the Liechtenstein postage stamps, which are sold to collectors through the offices specially reserved for this purpose by the Government of the Principality, must not figure in the above-mentioned accounts.

(3) In the telegraphic and telephonic traffic between Switzerland and Liechtenstein, the taxes and dues are also deducted for the profit of the country in which they are collected.

ART. 17.—(1) There is no rebate made with Liechtenstein on the subject of postal traffic between Switzerland and a third country. With what concerns the postal traffic between Liechtenstein and other States, such an allowance will not be necessary as long as the traffic remains about as intense in one sense as another.

(2) In the telegraphic and telephonic working between Liechtenstein and other countries, Liechtenstein receives such portion of the dues accruing to Switzerland from the outgoing traffic. With what concerns the incoming traffic between Liechtenstein and other countries the terminal tax is collected for the benefit of the State.

(3) Each of the contracting parties renounce the right of crediting their accounts with the dues from the transit in the postal, telegraphic and telephonic traffic between Switzerland and Liechtenstein.

ART. 18.—(1) The receipts accruing from the exploitation of the postal, telegraphic and telephone services in the Principality of Liechtenstein are primarily directed to cover the expenses of such exploitation. If the exploitation account shows a credit balance, such becomes the property of the Principality of Liechtenstein. A debit balance is charged to the account of the latter. It will, in addition, have to bear the expenses entailed by all constructions and acquisitions which, according to the opinion of the Swiss administrations, are necessary to the exploitation of the postal, telegraphic and telephone services of the Principality of Liechtenstein.

(2) Once the balance sheet is issued, such credit as acquired by either Switzerland or the Principality of Liechtenstein must be discharged in Swiss currency within a period of 14 days at latest after the acceptance of the accounts.

CHAPTER VIII.

FINAL RESOLUTIONS.

ART. 19.—(1) The present Convention will be ratified and will come into force after the exchange of the documents of ratification. It

can be published on the 1st of January or the 1st of July of the civil year, subject to six months' notice.

(2) Modifications can be incorporated in the present Convention by mutual consent without formal announcement.

(3) The Swiss postal administration and the Swiss telegraphic and telephone administration will decree the working arrangements necessary to the present Convention.

ART. 20.—In case of disagreement on the subject of the interpretation of the present Convention, the question in dispute shall be submitted to an arbitration tribunal should it be found impossible to settle the matter by diplomatic means. In this case each of the contracting parties shall choose an arbitrator. If the two arbitrators should not agree they will themselves appoint a referee or umpire.

In testimony whereof, the plenipotentiaries have signed the present Convention and have thereto set their seal.

Executed in duplicate, at Berne, the 10th day of November, 1920.

(L.S.)	(Signed)	MOTTA.
(L.S.)	(Signed)	BECK.

Certifies that the above Convention is ratified and has the force of law in all its parts, promising in the name of the Swiss Confederation, to observe it conscientiously at all times in so far as itself is concerned.

In testimony whereof the present ratification has been signed by the President and the Chancellor of the Swiss Confederation, and furnished with the federal seal.

Executed thus, at Berne, on the 28th January 1921.

In the name of the Swiss Federal Council.

(L.S.) SCHULTHESS.

The President of the Confederation.

(L.S.) STEIGER,

The Chancellor of the Confederation.

Certifies that the above Convention is ratified and has the force of law in all its parts, promising in the names of the Principality of Liechtenstein to observe it conscientiously at all times in so far as itself is concerned.

In testimony whereof the present ratification has been signed by the head of the Government of the Principality and furnished with the State seal of Liechtenstein.

Executed thus as Vaduz on the 27th of January, 1921.

In the name of the Government of the Principality of Liechtenstein.

(L.S.) DR. JOSEPH PEER,

The Head of the Government.

N.B.—The exchange of the documents of ratification took place at Berne on the 31st of January, 1921, and the Convention, in accordance with the Article 19 above, came into force on the 1st of February, 1921.

TANGANYIKA TERRITORY

(LATE GERMAN EAST AFRICA)

(See Maps 25, 28 and 29)

TANGANYIKA Territory is administered by a Governor assisted by an executive council.

CONTROL AND ADMINISTRATION.

There are at present no wireless stations in the territory, except one at Kigoma on Lake Tanganyika, which forms part of the Belgian Congo system (see page 75), nor has any legislation been formulated for the control of wireless telegraphy.

TUNIS

(See Maps 24 and 26)

TUNIS is a protectorate of France, under a Resident General, with Sidi Mahomed El Habid Bey at the head of the State.

CONTROL AND ORGANISATION.

The official wireless stations are controlled by the French Naval and Military authorities.

Private receiving stations may be installed without special licence, but subject to permission from the Director-General of Posts and Telegraphs, and to an annual tax of 20 francs. Leave to erect private transmitting stations may also be obtained from the Director-General of Posts and Telegraphs.

ADMINISTRATION.

For the laws and regulations relating to wireless in French Colonies, see under France and Algeria.

UGANDA PROTECTORATE.

(See Maps 25 and 28)

THE administration is conducted by a Governor and Commander-in-Chief, assisted by an Executive and Legislative Council.

CONTROL.

The general control of wireless telegraphy is under the administration of the Postmaster-General, Nairobi.

A station is projected for Kitgum, which will communicate direct with the Mongalla station in the Sudan.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Capt. W. G. Tucker	Telegraph Engineer	Entebbe
Mr. R. Rabson ..	Assistant Telegraph Engineer	Do.

ADMINISTRATION.

Wireless telegraphy is administered under the following Ordinance:—

ORDINANCE.

1. This Ordinance may be cited as "The Wireless Telegraphs Ordinance, 1908."

2. No person shall use or establish any apparatus or installation for the purpose of operating wireless telegraphs without a licence from the Governor.

Any person contravening the terms of this section shall be liable on conviction to a fine not exceeding Rs. 1,500 or imprisonment

of either kind for a term not exceeding twelve months, and any apparatus or installation in respect of which an offence under this section is committed may be forfeited and sold or disposed of as the Governor may direct.

3. It shall be lawful for the Governor from time to time by rules to prescribe the terms and conditions upon which licences to use or establish apparatus or installations for the purpose of operating wireless telegraphs may be granted.

UNITED STATES OF AMERICA

(See Maps 38, 39, 40, 41, 42.)

Including the Territory of Alaska.

N.B.—There are, moreover, DEPENDENCIES administered by the U.S.A. Government. Their rule is undertaken by a Governor and staff appointed by the President. Porto Rico and the Philippines belong to this division, although provided with Representative Government. Guam, in the Marianne Archipelago (Pacific Ocean), and the Samoan Islands are pure Dependencies administered by the U.S. Navy Department. Wireless in all these instances is controlled by the Navy Department in war time, but in peace time the radio stations of Porto Rico, Hawaii and Alaska are under the jurisdiction of the Department of Commerce, and all commercial transmitting radio stations operated in these dependencies must be licensed by this Department, and the operators of such stations must also be licensed.

The "CANAL ZONE" on the Isthmus of Panama ranks as a Dependency, but it has been judged best to print the wireless particulars relating thereto separately under the heading "Panama—Canal Zone."

CONTROL.

THE Congress of the United States has delegated to the Department of Commerce the duty of the enforcement of the Wireless Communication Laws and the International Radiotelegraph Convention. The work is handled through the Bureau of Navigation, Washington.

For the purpose of carrying on the International Ice Observation and Ice Patrol Service provided for by the International Convention for the Safety of Life at Sea, London, 1913-14, the U.S. Coast Guard cutters *Tampa* and *Modoc* have been detailed for this service.

The object of the Ice Patrol Service is to locate the icebergs and field ice nearest to the trans-Atlantic steamship lane, and to keep in touch with these fields as they move to the southward, in order that radio messages may be sent out daily, giving the whereabouts of the ice, particularly that in the immediate vicinity of the regular trans-Atlantic steamship lanes.

The Bureau of Standards transmits special signals of standard frequency about twice a month.

These special signals of standard frequency are of use to testing laboratories, transmitting station operators and others in standardising wave-meters and adjusting transmitting and receiving apparatus.

The Second National Radio Conference, which met in March, 1924, introduced a method of designating radio waves in kilocycles instead of wavelength in meters.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Officials.</i>	<i>Title.</i>	<i>Address.</i>
<i>Navy—</i> Captain Ridley McLean	Acting Director of Naval Communications	Washington
<i>Army—</i> Maj.-Gen. Charles McK. Saltzman ..	Chief Signal Officer	Washington
<i>Commerce—</i> Mr. Herbert Hoover	Secretary of Commerce	Washington
Mr. S. B. Davis	Acting Secretary of Commerce	Washington
Mr. D. B. Carson	Commissioner of Navigation	Washington
Mr. A. J. Tyrer	Deputy Commissioner of Navigation ..	Washington
Mr. W. D. Terrell	Chief Supervisor of Radio	Washington

There are, in addition, 10 Supervisors of Radio, 7 inspectors and assistant inspectors, stationed at various districts established by the Bureau of Navigation.

ADMINISTRATION.

The first Act requiring radio apparatus on certain passenger-carrying vessels was approved on June 24th, 1910. Under this Act the Secretary of Commerce and Labour organised, on July 1st, 1911, the radio service of the Bureau of Navigation.

The second Act, approved July 23rd, 1912, amended the above Act to cover all vessels navigating the ocean or the Great Lakes, and licensed to carry or carrying 50 or more persons, including passengers or crew or both, with the exception of steamers plying between ports or places less than 200 miles apart. The Act to regulate radio communication was approved August 13th, 1912. Under this Act transmitting stations and radio operators are licensed by the Secretary of Commerce. Transmitting stations are inspected to determine if they comply with the requirements of the law. Radio operators are examined in order to determine their qualifications. In addition to the above-mentioned Acts the department also enforces the London International Radiotelegraphic Convention rules of 1912, to which the United States is a party.

We print below the text of the Acts and Regulations at present in force in the United States :—

A—Act of July 23rd, 1912.

B—Act of August 13th, 1912.

C—Regulations, 1912.

D—Regulations governing Ship and Land Radio Stations (as amended April 15th and May 1st, 1920).

E—Regulations governing Radio Operators.

F—General Information.

- G**—Certificate of Radio Inspection.
- H**—Master's Certificate of Radio Apparatus.
- I**—Radio Declaration, Form 753a.
- J**—Master's Certificate, Clearance Form 753b.
- K**—Licence for General Public Service Coast Radio Station.
- L**—Licence for Ship Radio Station.
- M**—Licence for Land Radio Station.
- N**—Licence for Amateur Radio Station.
- O**—Licence to Radio Operator, Commercial Extra First Grade.
- P**—Licence to Radio Operator, Commercial Grade.
- Q**—Licence to Radio Operator, Amateur First Grade.
- R**—Licence to Radio Operator, Amateur Second Grade.
- S**—Notice to Berne Bureau.
- T**—Act concerning International Communication.
- U**—United States Radio Compass Stations.
- V**—Public Resolution No. 48, dated June 5th, 1920 (amended April 14th, 1922.)

A An Act approved July 23rd, 1912, amending section 1 of an Act entitled "An Act to require apparatus and operators for radio communication on certain ocean steamers," approved June 24th, 1910.*

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

"SEC. 1. That from and after October first, nineteen hundred and twelve, it shall be unlawful for any steamer of the United States or of any foreign country navigating the ocean or the Great Lakes and licensed to carry, or carrying, fifty or more persons, including passengers or crew or both, to leave or attempt to leave any port of the United States unless such steamer shall be equipped with an efficient apparatus for radio communication, in good working order, capable of transmitting and receiving messages over a distance of at least one hundred miles, day or night. An auxiliary power supply, independent of the vessel's main electric power plant, must be provided which will enable the sending set for at least four hours to send messages over a distance of at least one hundred miles, day or night, and efficient communication between the operator in the radio room and the bridge shall be maintained at all times.

"The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars.

"That the provisions of this section shall not apply to steamers plying between ports, or places, less than two hundred miles apart."

SEC. 2. That this Act, so far as it relates to the Great Lakes, shall take effect on and after April first, nineteen hundred and thirteen,

and so far as it relates to ocean cargo steamers shall take effect on and after July first, nineteen hundred and thirteen: *Provided*, That on cargo steamers, in lieu of the second operator provided for in this Act, there may be substituted a member of the crew or other person who shall be duly certified and entered in the ship's log as competent to receive and understand distress calls or other usual calls indicating danger, and to aid in maintaining a constant wireless watch so far as required for the safety of life.

The remaining sections of the Act of June 24th, 1910, which are unchanged, read as follows:—

SEC. 2. That for the purpose of this Act apparatus for radio communication shall not be deemed to be efficient unless the company installing it shall contract in writing to exchange, and shall, in fact, exchange, as far as may be physically practicable, to be determined by the master of the vessel, messages with shore or ship stations using other systems of radio communication.

SEC. 3. That the master or other person being in charge of any such vessel which leaves or attempts to leave any port of the United States in violation of any of the provisions of this Act shall, upon conviction, be fined in a sum not more than five thousand dollars, and any such fine shall be a lien upon such vessel, and such vessel may be libelled therefor in any district court of the United States within the jurisdiction of which such vessel shall arrive or depart, and the leaving or attempting to leave each and every port of the United States shall constitute a separate offence.

SEC. 4. That the Secretary of Commerce shall make such regulations as may be necessary to secure the proper execution of this Act by collectors of customs and other officers of the Government.

B AN ACT TO REGULATE RADIO COMMUNICATION.

APPROVED AUGUST 13TH, 1912.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a person, company or corporation within the jurisdiction of the United States shall not use or operate any apparatus for radio communication as a means of commercial intercourse among the several States, or with foreign

* The amended Act applies to vessels licensed to carry, as well as those actually carrying, 50 or more persons, etc.

nations, or upon any vessel of the United States engaged in interstate or foreign commerce, or for the transmission of radiograms or signals the effect of which extends beyond the jurisdiction of the State or Territory in which the same are made, or where interference would be caused thereby with the receipt of messages or signals from beyond the jurisdiction of the said State or Territory, except under and in accordance with a licence, revocable for cause, in that behalf granted by the Secretary of Commerce upon application therefor; but nothing in this Act shall be construed to apply to the transmission and exchange of radiograms or signals between points situated in the same State: *Provided*, That the effect thereof shall not extend beyond the jurisdiction of the said State or interfere with the reception of radiograms or signals from beyond said jurisdiction; and a licence shall not be required for the transmission or exchange of radiograms or signals by or on behalf of the Government of the United States, but every Government station on land or sea shall have special call letters designated and published in the list of radio stations of the United States by the Department of Commerce. Any person, company, or corporation that shall use or operate any apparatus for radio communication in violation of this section, or knowingly aid or abet another person, company, or corporation in so doing, shall be deemed guilty of a misdemeanour, and on conviction thereof shall be punished by a fine not exceeding five hundred dollars, and the apparatus or device so unlawfully used and operated may be adjudged forfeited to the United States.

Sec. 2.—That every such licence shall be in such form as the Secretary of Commerce shall determine and shall contain the restrictions, pursuant to this Act, on and subject to which the licence is granted; that every such licence shall be issued only to citizens of the United States or Porto Rico or to a company incorporated under the laws of some State or Territory or of the United States or Porto Rico, and shall specify the ownership and location of the station in which said apparatus shall be used and other particulars for its identification and to enable its range to be estimated; shall state the purpose of the station, and, in case of a station in actual operation at the date of passage of this Act, shall contain the statement that satisfactory proof has been furnished that it was actually operating on the above-mentioned date; shall state the wavelength or the wavelengths authorised for use by the station for the prevention of interference and the hours for which the station is licensed for work; and shall not be construed to authorise the use of any apparatus for radio communication in any other station than that specified. Every such licence shall be subject to the regulations contained herein, and such regulations as may be established from time to time by authority of this Act or subsequent Acts and treaties of the United States. Every such licence shall provide that the President of the United States in time of war or public peril or disaster may cause the closing of any station for radio communication and the removal therefrom of all radio apparatus, or may authorise the use or control of any such station or apparatus by any department of the Government, upon just compensation to the owners.

Sec. 3.—That every such apparatus shall at all times while in use and operation as afford-

said be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce. Every person so licensed who in the operation of any radio apparatus shall fail to observe and obey regulations contained in or made pursuant to this Act or subsequent Acts or treaties of the United States, or any one of them, or who shall fail to enforce obedience thereto by an unlicensed person while serving under his supervision, in addition to the punishments and penalties herein prescribed, may suffer the suspension of the said licence for a period to be fixed by the Secretary of Commerce not exceeding one year. It shall be unlawful to employ any unlicensed person or for any unlicensed person to serve in charge or in supervision of the use and operation of such apparatus, and any person violating this provision shall be guilty of a misdemeanour, and on conviction thereof shall be punished by a fine of not more than one hundred dollars or imprisonment for not more than two months, or both, in the discretion of the court for each and every such offence: *Provided*, That in case of emergency the Secretary of Commerce may authorise a collector of customs to issue a temporary permit, in lieu of a licence, to the operator on a vessel subject to the radio ship Act of June 24th, 1910.

Sec. 4.—That for the purpose of preventing or minimising interference with communication between stations in which such apparatus is operated, to facilitate radio communication, and to further the prompt receipt of distress signals, said private and commercial stations shall be subject to the regulations of this section. These regulations shall be enforced by the Secretary of Commerce through the collectors of customs and other officers of the Government as other regulations herein provided for.

The Secretary of Commerce may, in his discretion, waive the provisions of any or all of these regulations when no interference of the character above mentioned can ensue.

The Secretary of Commerce may grant special temporary licences to stations actually engaged in conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours, and under such conditions as will ensure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations.

In these regulations the naval and military stations shall be understood to be stations on land.

REGULATIONS.

Normal Wavelength.

C 1. Every station shall be required to designate a certain definite wavelength as the normal sending and receiving wavelength of the station. This wavelength shall not exceed 600 metres or it shall exceed 1,600 metres. Every coastal station open to general public service shall at all times be ready to receive messages of such wavelengths as are required by the Berlin Convention. Every ship station, except as hereinafter provided, and every coast station open to general public service, shall be prepared to use two sending wavelengths, one of 300 metres and one of 600 metres, as required by the International Convention in

force: *Provided*, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservation made by regulations first and second to accord with any international agreement to which the United States is a party.

Other Wavelengths.

2. In addition to the normal sending wavelength all stations, except as provided hereinafter in these regulations, may use other sending wavelengths: *Provided*, That they do not exceed 600 metres or that they do exceed 1,600 metres: *Provided further*, That the character of the wave emitted conforms to the requirements of regulations 3 and 4 following.

Use of a "Pure Wave."

3. At all stations if the sending apparatus, to be referred to hereinafter as the "transmitter," is of such a character that the energy is radiated in two or more wavelengths, more or less sharply defined, as indicated by a sensitive wavemeter, the energy in no one of the lesser waves shall exceed 10 per cent. of that in the greatest.

Use of a "Sharp Wave."

4. At all stations the logarithmic decrement per complete oscillation in the wave trains emitted by the transmitter shall not exceed two-tenths, except when sending distress signals or signals and messages relating thereto.

Use of "Standard Distress Wave."

5. Every station on shipboard shall be prepared to send distress calls on the normal wavelength designated by the international convention in force, except on vessels of small tonnage unable to have plants insuring that wavelength.

Signal of Distress.

6. The distress call used shall be the international signal of distress • • • — — — • • •

Use of "Broad Interfering Wave" for Distress Signals.

7. When sending distress signals, the transmitter of a station on shipboard may be tuned in such a manner as to create a maximum of interference with a maximum of radiation.

Distance Requirement for Distress Signals.

8. Every station on shipboard, wherever practicable, shall be prepared to send distress signals of the character specified in regulations 5 and 6 with sufficient power to enable them to be received by day over sea a distance of 100 nautical miles by a shipboard station equipped with apparatus for both sending and receiving equal in all essential particulars to that of the station first mentioned.

"Right of Way" for Distress Signals.

9. All stations are required to give absolute priority to signals and radiograms relating to ships in distress; to cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, to refrain from sending until all signals and radiograms relating thereto are completed.

Reduced Power for Ships near a Government Station.

10. No station on shipboard when within fifteen nautical miles of a naval or military station shall use a transformer input exceeding 1 kW., nor, when within five nautical miles of such a station, a transformer input exceeding $\frac{1}{2}$ kW., except for sending signals of distress, or signals or radiograms relating thereto.

Intercommunication.

11. Each shore station open to general public service between the coast and vessels at sea shall be bound to exchange radiograms with any similar shore station and with any ship station without distinction of the radio systems adopted by such stations, respectively, and each station on shipboard shall be bound to exchange radiograms with any other station on shipboard without distinction of the radio systems adopted by each station, respectively.

It shall be the duty of each such shore station, during the hours it is in operation, to listen-in at intervals of not less than fifteen minutes, and for a period not less than two minutes, with the receiver tuned to receive messages of 300 metre wavelengths.

Division of Time.

12. At important seaports and at all other places where naval or military and private or commercial shore stations operate in such close proximity that interference with the work of naval and military stations cannot be avoided by the enforcement of the regulations contained in the foregoing regulations concerning wavelengths and character of signals emitted, such private or commercial shore stations as do interfere with the reception of signals by the naval and military stations concerned shall not use their transmitters during the first fifteen minutes of each hour, local standard time. The Secretary of Commerce may, on the recommendation of the department concerned, designate the station or stations which may be required to observe this division of time.

Government Stations to Observe Division of Time.

13. The naval or military stations for which the above-mentioned division of time may be established shall transmit signals or radiograms only during the first fifteen minutes of each hour, local standard time, except in case of signals or radiograms relating to vessels in distress, as hereinbefore provided.

Use of Unnecessary Power.

14. In all circumstances, except in case of signals or radiograms relating to vessels in distress, all stations shall use the minimum amount of energy necessary to carry out any communication desired.

General Restrictions on Private Stations.

15. No private or commercial station not engaged in the transaction of bona fide commercial business by radio communication or in experimentation in connection with the development and manufacture of radio apparatus for commercial purposes shall use a transmitting wavelength exceeding 200 metres or a transformer input exceeding 1 kW., except by special authority of the Secretary of Commerce contained in the licence of the station: *Provided*, That the owner or operator of a station of the character mentioned in this regulation shall not be liable for a violation of the requirements of the third or fourth regulations to the penalties of one hundred dollars or twenty-five dollars, respectively, provided in this section unless the person maintaining or operating such station shall have been notified in writing that the said transmitter has been found, upon tests conducted by the Government, to be so adjusted as to violate the said third and fourth regulations, and opportunity has been given to said owner or operator to adjust said transmitter in conformity with said regulations.

Special Restrictions in the Vicinities of Government Stations.

16. No station of the character mentioned in regulation 15 situated within five nautical miles of a naval or military station shall use a transmitting wavelength exceeding 200 metres or a transformer input exceeding $\frac{1}{4}$ kW.

Ship Stations to Communicate with Nearest Shore Stations.

17. In general, the shipboard stations shall transmit their radiograms to the nearest shore station. A sender on board a vessel shall, however, have the right to designate the shore station through which he desires to have his radiograms transmitted. If this cannot be done, the wishes of the sender are to be complied with only if the transmission can be effected without interfering with the service of other stations.

Limitations for Future Installations in Vicinities of Government Stations.

18. No station on shore not in actual operation at the date of the passage of this Act shall be licensed for the transaction of commercial business by radio communication within fifteen nautical miles of the following naval or military stations, to wit: Arlington, Virginia; Key West, Florida; San Juan, Porto Rico; North Head and Tatoosh Island, Washington; San Diego, California; and those established or which may be established in Alaska and in the Canal Zone; and the head of the department having control of such Government stations shall, so far as is consistent with the transaction of governmental business, arrange for the transmission and receipt of commercial radiograms under the provisions of the Berlin Convention of 1906, and future International Conventions or treaties to which the United States may be a party, at each of the stations above referred to, and shall fix the rates therefor, subject to control of such rates by Congress. At such stations and wherever and whenever shore stations open for general public business between the coast and vessels at sea under the provisions of the Berlin Convention of 1906 and future International Conventions and treaties to which the United States may be a party shall not be so established as to insure a constant service day and night without interruption, and in all localities wherever or whenever such service shall not be maintained by a commercial shore station within 100 nautical miles of a naval radio station, the Secretary of the Navy shall, so far as is consistent with the transaction of governmental business, open naval radio stations to the general public business described above, and shall fix rates for such service, subject to control of such rates by Congress. The receipts from such radiograms shall be covered into the Treasury as miscellaneous receipts.

Secrecy of Messages.

19. No person or persons engaged in or having knowledge of the operation of any station or stations, shall divulge or publish the contents of any messages transmitted or received by such station, except to the person or persons to whom the same may be directed or their authorised agent, or to another station employed to forward such message to its destination, unless legally required so to do by the court of competent jurisdiction or other competent authority. Any person guilty of divulging or publishing any message, except as herein provided, shall, on conviction thereof, be punished by a fine of not more than two

hundred and fifty dollars or imprisonment for a period of not exceeding three months, or both fine and imprisonment, in the discretion of the court.

Penalties.

For violation of any of these regulations, subject to which a licence under sections 1 and 2 of this Act may be issued, the owner of the apparatus shall be liable to a penalty of one hundred dollars, which may be reduced or remitted by the Secretary of Commerce and for repeated violations of any of such regulations the licence may be revoked.

For violation of any of these regulations, except as provided in regulation 19, subject to which a licence under section 3 of this Act may be issued, the operator shall be subject to a penalty of twenty-five dollars, which may be reduced or remitted by the Secretary of Commerce, and for repeated violations of any such regulations, the licence shall be suspended or revoked.

SEC. 5.—That every licence granted under the provisions of this Act for the operation or use of apparatus for radio communication shall prescribe that the operator thereof shall not wilfully or maliciously interfere with any other radio communication. Such interference shall be deemed a misdemeanour, and upon conviction thereof the owner or operator, or both, shall be punishable by a fine of not to exceed five hundred dollars or imprisonment for not to exceed one year, or both.

SEC. 6.—That the expression "radio-communication" as used in this Act means any system of electrical communication by telegraphy or telephony without the aid of any wire connecting the points from and at which the radiograms, signals, or other communications are sent or received.

SEC. 7.—That a person, company, or corporation within the jurisdiction of the United States shall not knowingly utter or transmit, or cause to be uttered or transmitted, any false or fraudulent distress signal or call or false or fraudulent signal, call, or other radiogram of any kind. The penalty for so uttering or transmitting a false or fraudulent distress signal or call shall be a fine of not more than two thousand five hundred dollars or imprisonment for not more than five years, or both, in the discretion of the court for each and every such offence, and the penalty for so uttering or transmitting, or causing to be uttered or transmitted, any other false or fraudulent signal, call, or other radiogram shall be a fine of not more than one thousand dollars or imprisonment for not more than two years, or both, in the discretion of the court, for each and every such offence.

SEC. 8.—That a person, company, or corporation shall not use or operate any apparatus for radio communication on a foreign ship in territorial waters of the United States otherwise than in accordance with the provisions of sections 4 and 7 of this Act, and so much of section 5 as imposes a penalty for interference. Save as aforesaid, nothing in this Act shall apply to apparatus for radio communication on any foreign ship.

SEC. 9.—That the trial of any offence under this Act shall be in the district in which it is committed, or if the offence is committed upon the high seas or out of the jurisdiction of any particular State or district the trial shall be in the district where the offender may be found or into which he shall be first brought.

SEC. 10.—That this Act shall not apply to the Philippine Islands.

SEC. 11.—That this Act shall take effect and be in force on and after four months from its passage.

REGULATIONS GOVERNING SHIP AND LAND RADIO STATIONS.

SHIP STATIONS.

1. On vessels coming under the Ship Acts, an emergency power supply, independent of the vessel's main electric power plant, must be provided which will enable radio messages to be sent for at least four hours over a distance of at least 100 miles day or night. The emergency power supply and equipment should be located and installed in such manner as to afford maximum protection against accident.

2. The radio transmitting apparatus operated from the emergency power supply, should be capable of functioning within two minutes after unexpected notice to the operator.

3. The complete equipment must be maintained in an efficient condition at sea.

4. The complete emergency equipment should be tested before each sailing and daily at sea by the operator or an inspector and a note of its performance entered in the radio log.

5. Radio inspectors or other duly authorised officers of the Government will occasionally call for test messages to be sent by means of the emergency apparatus, while the vessel is at sea.

6. An "induction coil" connected to "plain aerial" is not recommended as emergency apparatus on account of the high voltages produced which frequently damage the antenna insulation and on account of "vibrator troubles."

7. A motor generator or rotary converter operated by storage battery is probably the most satisfactory means available at present of energising the transmitting apparatus.

8. Any auxiliary engine for wireless purposes must operate on a fuel which will fulfil the requirements of Rule XI, section 5, of the General Rules and Regulations of the Steamboat Inspection Service, reading as follows:

None of the inflammable articles specified in section 4472, Revised Statutes, or oil that will not stand a fire test of 300° F. shall be used as stores on any pleasure steamer or steamer carrying passengers except that vessels not carrying passengers for hire may transport gasoline or any of the products of petroleum for use as a source of motive power for motor boats or launches of such vessels (Sec. 4472, R.S.)

9. Every ship station shall carry a reasonable number of spares of such parts of both the main and emergency radiotelegraph equipments as are subject to undue wear, deterioration, or liability to accident.

10. One extra pair of head telephones, extra cords, and extra detectors must always be kept on hand.

11. A storage battery voltmeter, hydrometer, a supply of electrolyte, and distilled water should be part of the regular equipment, but are not prescribed in terms by statute. The absence of these and similar inexpensive emergency articles will be brought to the attention of the master and of the company installing the apparatus by the radio inspector, in writing, and if after a reasonable interval

they have not been supplied, the inspector will communicate the fact to the Commissioner of Navigation.

12. The vessel's electric power for the operation of the main equipment shall, at all times while the steamer is under way, be available for the radio operator's use. On steamers where the dynamo is not run continuously there should be an efficient means of communication between the radio room and the dynamo room, in order that the radio operator may signal for power, as the law provides that he may not leave his post of duty.

13. Efficient communication between the radio room and the bridge must be maintained. A speaking tube or telephone will comply with this requirement. A bell and messenger service will not be acceptable unless there are special conditions justifying this equipment. The speaking tube or telephone must terminate in the radioroom and on the bridge, or in the chart room if readily accessible from the bridge. If the radio room is adjacent to or accessible from the bridge so that orders may be transferred direct, no means of communication will be required. Any arrangement calling for the services of a third person to transmit the messages will not be satisfactory. The radio inspectors will notify the ship authorities whether the means of communication provided is satisfactory at the time of inspection.

14. On vessels of the United States it is the statutory duty of the master to see that one operator is on duty at all times. The radio service of the ship is under the supreme authority of the master.

15. Masters should require operators on duty to communicate with the officer on the bridge every half-hour.

16. Operators must make entries on the radio log every fifteen minutes, as evidence that a continuous watch is being maintained. The entries must, if possible, consist of the call letters of other stations communicating and a few words of the intercepted messages.

17. When vessels are in port the key to the radio room must at all times be on board in charge of the proper officer and the radio equipment shall be in such condition as to facilitate Government inspection.

CLASSIFICATION OF SHIP STATIONS AND GRADES OF OPERATORS REQUIRED.

18. First Class: Vessels having a continuous service. There shall be placed in the first-class vessels which are intended to carry twenty-five or more passengers:

(1) If they have an average speed in service of fifteen knots or more.

(2) If they have average speed in service of more than thirteen knots, but only subject to the two-fold condition that they have on board 200 persons or more (passengers and crew), and that, in the course of their voyage, they go to a distance of more than 500 sea miles between any two consecutive ports.

19. Second Class: Vessels having a continuous watch but a service of limited duration. Other vessels placed in the second-class must, during navigation, maintain a continuous watch for at least seven hours a day, and a watch of ten minutes at the beginning of every other hour.

20. Third Class: Vessels which have no fixed periods of service. All vessels which are placed neither in the first nor in the second-class shall be placed in the third-class.

21. Service may be defined as preparedness to transmit and receive radio messages or

signals at the rate of at least twenty words per minute.

22. *Watch* may be defined as preparedness to receive distress signals and call letters slowly. A "watcher" or cargo-grade operator will summon a first or second-class operator if necessary.

23. All American vessels required by the Act of July 23rd, 1912, to be equipped with radio apparatus, and operators *must* at all hours maintain a continuous *watch*; that is to say, an operator or *watcher* must be "listening-in" continuously. This requirement is outside of and above the requirement based on the classification under which the ship's station is licensed.

24. Vessels voluntarily equipped are not required to maintain this continuous *watch*. Vessels voluntarily equipped are, however, subject to the following requirements as to *watch* according to the class assigned to them in their station licences.

25. If a licence of the second class be issued to a voluntarily equipped vessel, the station *must* maintain a continuous *watch* for at least seven hours a day and a *watch* of ten minutes at the beginning of every hour.

26. The grade of operators required on vessels of each class are prescribed in the London Convention Service Regulations, Article X. A continuous *watch* may be maintained by one commercial second-grade operator and one cargo-grade operator on cargo steamers.

27. Passenger vessels coming under the Act of July 23rd, 1912, which carry or are licensed to carry twenty-five or more passengers, *must* be placed in the first class:

(a) If they have an average speed in service of fifteen knots or more.

(b) If they have an average speed in service of more than thirteen knots, but only subject to the twofold condition that they have on board 200 persons or more (passengers and crew), and that in the course of their voyage they go a distance of more than 500 sea miles between any two consecutive ports.

The *service* shall be carried on by at least two commercial first-grade operators.

28. Cargo vessels coming under the Act of July 23rd, 1912, which are required to maintain a continuous *watch*, *must* be placed in the second class if continuous *service* is not maintained. On cargo steamers a continuous *watch* may be maintained by at least one commercial second-grade operator and one cargo-grade operator.

29. Passenger vessels coming under the Act of July 23rd, 1912, but which are not required to be entered in the first class, may be entered in the first or second class, according to whether continuous *service* or continuous *watch* is maintained. The number and grade of operators required is determined by *service* or *watch*. On passenger vessels coming under the Ship Act but entered in the second class at least two second-grade operators are required to maintain continuous *watch*.

30. Cargo vessels which coming under the Act of July 23rd, 1912, and are required to maintain a continuous *watch*, may be placed in the first class, if continuous *service* is maintained. (For operators, see par. 28.)

31. All vessels voluntarily equipped with radio apparatus and which have no specified hours of *service* or *watch* must be placed in the third class.

32. Any vessel voluntarily equipped may be placed in the first class if continuous *service*

is maintained, or in the second class if a continuous *watch*, or a *watch* of limited duration, such as specified above for vessels of the second class is maintained.

33. In all ship stations transmissions shall be made only by operators holding commercial first or second grade licences or higher.

34. Commercial *service* shall be maintained by not lower than commercial first-grade operators.

35. Vessels which are voluntarily equipped with radio apparatus for their own convenience and for the correspondence of officers and crew must employ at least one commercial second-grade operator or higher.

36. Radio telephone apparatus on vessels not coming under the Act of July 23rd, 1912, must be operated by a person holding a cargo-grade licence or higher.

37. The owners of ship stations desiring to change the classification of a ship must apply for a new licence.

LAND-STATIONS.

38. Coast stations are stations which transmit messages to vessels at sea or on the Great Lakes, or whose operations can interfere with the exchange of messages between ship and ship or ship and coast. The principal purpose of the regulation of radio communication, international and national, is to secure the greatest efficiency of maritime communication through this agency especially as a means of promoting safety to life.

39. Inland stations are stations which cannot transmit messages to vessels at sea or on the Great Lakes and whose operations cannot affect the transmission of messages between ship and ship or ship and coast. This may be due to their geographical location or to their range, dependent on power and aerial, or conditions. In some instances actual inspection may be necessary to determine whether a station should be licensed as a coast station or an inland station. An operator or owner in doubt as to the classification of his station should communicate the facts to the radio inspector of his district when applying for a licence.

40. Stations are bound to give absolute priority to calls of distress from ships, to similarly answer such calls, and to take such action with regard thereto as may be required.

41. The working of stations shall be organised as far as possible in such manner as not to disturb the service of other stations.

42. All coast stations (par. 38), excepting general and restricted amateur stations, are required to be able to transmit on the wavelengths of 300 and 600 metres for the purpose of transmitting or relaying distress messages or signals and messages relating thereto, if necessary.

43. Coast stations primarily intended for long waves and long-distance transmission may install an auxiliary antenna and auxiliary transmitter to comply with the short wavelength requirements.

44. The international standard wavelength is 600 metres, and the operators of all coast stations are required, during the hours the station is in operation, to "listen-in" at intervals of not less than fifteen minutes and for a period of not less than two minutes, with the receiving apparatus tuned to receive this wavelength, for the purpose of determining if any distress signals or messages are being sent and to determine if the transmitting

operations of the "listening stations" are causing interference with other radio communication.

45. General public service may be defined as "paid business," conducted on commercial wavelengths between ship and shore or ship and ship.

46. Limited public service may be defined as "paid business" between certain designated land stations, ships or lines of ships, and must be conducted on some authorised wavelength other than 300 or 600 metres.

47. All special service must be conducted on some authorised wavelength other than 300 or 600 metres, not interfering with general public service.

48. Limited commercial, special amateur, and all stations which have no authorised rates, shall not transmit or accept public correspondence from other stations, except in case of emergency.

49. If a general public-service coast station also maintains a limited commercial service with other stations on land or with vessels at sea, the limited commercial service must be conducted on some authorised wavelength other than 300 or 600 metres, but this service can be authorised on a general public-service coast station licence without stating the specific hours, it being understood that the limited commercial service is conducted only when no general public service business is on file.

50. If a general public-service coast station also maintains a public service between fixed points on land, the service between the and stations must be conducted on some authorised wavelength other than 300 or 600 metres, and a separate form, No. 761, should be submitted covering "Limited public service," giving the exact hours of such service.

CLASSIFICATION OF LAND STATIONS AND GRADES OF OPERATORS REQUIRED.

51. Both coast stations (the word "coast stations," "shore stations," and "coastal stations" are used interchangeably) and inland stations are divided for the purposes of the administration of the Act into the following classes:

- (1) Public-service stations—
 - (a) General.
 - (b) Limited.
- (2) Limited commercial stations.
- (3) Experiment stations for the development of radio communication.
- (4) Technical and training school station.
- (5) Special amateur stations.
- (6) General amateur stations.
- (7) Restricted amateur stations.

52. CLASS 1.—(a) *Public Service stations, general*, are those open to general business between coast and ships and include those operated by common carriers under the Act of February 4th, 1887, to regulate commerce, amended June 18th, 1910. They are required to maintain a constant service when open. Every coastal station open to public service shall at all times be ready to receive messages of such wavelengths as are required by the International Convention in force. (Sec. 4, Regulation 1, Act of August 13th, 1912.) The station rates are authorised in the licence and published in the Official Berne List. Whenever such stations do not insure a constant service, transmitting and receiving day and night without interruption, the Secretary of the Navy is directed to open naval radio stations within 100 miles thereof to public

business. (Sec. 4, Regulation 18, Act of August 13th, 1912.) The Secretary of War is authorised by the Act of May 26th, 1900 (31 Stat., 206), to open Alaskan military stations to public service.

53. General public service shall be conducted only by operators holding commercial first-grade licences or higher.

54. CLASS 1.—(b) *Public-service stations, limited*, are reserved for a limited public service, determined by the object of the correspondence or other circumstances independent of the system employed. Stations of this class transmit and receive public messages to and from certain stations only, which are designated in the licence. The rates are authorised in the licences, and if not published in the official list they may be obtained from the licensee.

55. The service of limited public service coast stations shall be carried on by commercial first-grade operators or higher.

56. The service of limited public service inland stations shall be carried on by commercial second-grade operators or higher.

57. CLASS 2.—*Limited commercial stations* are not open to public service and are licensed for a specific commercial service or services defined in the licence. Stations of this class must not transmit to or accept public messages from other stations. No rates are authorised.

Licences of this class are required for all transmitting radio stations used for broadcasting news, music, lectures, church services, Government reports, and such matters, and do not permit the transmission of private or commercial communications.

The reading of telegrams or letters by broadcasting stations will not be construed as point-to-point communication so long as the signer is not addressed in person and so long as the text matter is of general interest.

Broadcasting stations must be operated by or under the supervision of an operator holding a commercial second-class licence or higher; such operator must be on duty during the entire time the station is being operated.

No testing or experimenting is authorised in broadcasting stations between the hours of 10 a.m. and midnight, local standard time.

Broadcasting stations the operation of which interfere with the reception of time signals and meteorological information by marine service must remain silent while such signals are being transmitted.

Class A radiotelephone broadcasting stations.

Class A radiotelephone broadcasting station licences will be issued to stations equipped to use power not exceeding 500 watts in the antenna and will be assigned a wavelength between 222 metres (1,350 kilocycles) and 300 metres (1 000 kilocycles). Where more than one station of this class are licensed in the same city or locality, a division of time will be required, if necessary.

Class B radiotelephone broadcasting stations.

A licence will not be issued for a station in this class which does not comply in every respect with the specifications hereunder.

Specifications covering the requirements governing the construction, licensing, operating, and service of class B radiotelephone broadcasting stations.

Station.

Wavelength.—The wavelengths between 300 and 345 and 375 and 545 metres only will be assigned for the use of stations of this class, which must be free from harmonics. Whenever necessary,

the use of a coupled circuit transmitter will be required. Hereafter but one wavelength within these ranges, including the 400 metres wavelength, will be assigned to any one locality.

Power.—The power supply must be dependable and non-fluctuating. The minimum required will be 500 watts in the antenna and the maximum shall not exceed 1,000 watts in the antenna.

Modulation.—The system must be so arranged as to cause the generated radio frequency to vary accurately according to the sound impressed upon the microphone system.

Spare parts.—Sufficient tubes and other material must be readily available to insure continuity and reliability of the announced schedule of service.

Antenna.—The antenna must be so constructed as to prevent swinging.

Signalling system.—Some adequate and dependable system must be provided for communication between the operating room and the studio.

Studio.—The radio equipment in the studio must be limited to that essential for use in the room. The room shall be so arranged as to avoid sound reverberation and to exclude external and unnecessary noises.

Service.

Programs.—The programs must be carefully supervised and maintained to insure satisfactory service to the public.

Music.—The use of mechanically operated musical instruments is prohibited.

Division of time.—Where two or more stations of class B are licensed in the same city or locality, a division of time will be required, if necessary

Forfeiture of Class B privilege.

Licences issued for the use of the wavelengths between 300 and 345 metres and 375 and 545 metres shall specifically provide that any failure to maintain the standards prescribed for such stations may result in the forfeiture of the class B privilege and relicensing of the station to use a wavelength below 300 metres.

Class C radiotelephone broadcasting stations.

All radiotelephone broadcasting stations now licensed to use 360 metres (834 kilocycles) are placed in this class. No new licences will be issued for stations to use this wavelength. Renewal licences for the use of 360 metres will be granted if desired.

REGULATIONS FOR BROADCASTING STATIONS.

The department has accepted the recommendations of the Second National Radio Conference, and immediate steps will be taken to put the plan into effect as far as found practicable.

The United States is divided into five zones with separate wavelengths designated for certain localities in each zone.

It is proposed to put the reallocation of wavelengths plan into effect at noon, May 15, 1923.

Radio inspectors will notify the owners of all licensed class B stations of the wavelength assigned for their locality under the new plan and advise those stations of this class who are not on 360 metres to make provisions to use the new wavelength at the time specified. The new wavelength must not be used for broadcasting prior to the date indicated. The use of the 400-metre wavelength will not be permitted after May 15, 1923, except by the station to which this specific wavelength is assigned under the new plan.

Hereafter all Government reports will be sent on the wavelength assigned to the station, and the exclusive use of the 485-metre wavelength will be discontinued for this service.

Stations now licensed to use 360 metres (now placed in class C) have the privilege of transferring to class A and using a wavelength between 222 and 300 metres, which will be designated by the radio inspector, or, if they can qualify, transferring to class B and using the wavelength designated for that locality within the band between 300 and 345 metres and 375 and 545 metres.

Where two or more stations of one class operate in the same city or locality a division of time will be required, if necessary.

VIOLATION OF ACT OF AUGUST 13, 1912, BY BROADCASTING STATIONS.

Under the reallocation of wavelengths plan effective May 15, 1923, it will be necessary for all transmitting radio stations to be accurately adjusted to the wavelength specified in the licence. Any variation from this rule may be considered a violation of section 2, Act of August 13, 1912, justifying the revocation or suspension of the station licence.

Beginning May 15, radio inspectors of each district will carefully check the transmitting wavelengths of stations in their districts by personal inspection of the stations as far as practicable and by listening in with accurately calibrated receivers and report to the department promptly any discrepancies observed.

The Bureau of Standards will transmit standard wavelengths from time to time which will be helpful in determining accurate wavelengths and will also listen-in and check the wavelengths being used.

58. If a coast station, the operators shall hold a commercial second-grade licence or higher. (Par. 57.)

59. **CLASS 3. — Experimental stations.** — The Secretary of Commerce is authorised by section 4 of the Act to grant special temporary licences "to stations actually engaged in conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power on any wavelengths, at such hours and under such conditions as will insure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations." Applicants for such licences should state any technical result they have already produced, their technical attainments, etc. The fact that an applicant desires to experiment with his equipment does not justify or require a licence of this class. Most experiments can be made within the limitations of general and restricted amateur station licences or by use of an artificial antenna to prevent radiation.

60. Experiment stations may be operated by a person holding an experiment and instruction grade licence or higher.

61. **CLASS 4. — Technical and training-school stations** will be licensed, according to the degree of technical training attained and imparted and to local conditions.

62. The grade of operators required will be specified when the licence is issued.

63. **CLASS 5. — Special amateur stations** may be licensed by the Secretary of Commerce to use a longer wavelength and a higher power on special application. Applications for this class from amateurs with less than two years' experience in actual radio communication will not be approved. The application must state the experience and purpose of the

applicant, the local conditions of radio communication, especially of maritime radio communication in the vicinity of the station, and a special licence will be granted only if some substantial benefit to the art or to commerce apart from individual amusement seems probable. (Sec. 4, Regulation 15, Act of August 13th, 1912.)

64. Special amateur coast stations must be operated by a person holding a commercial second-grade licence or higher. Inland stations may be operated by persons holding amateur second-grade licences or higher.

65. CLASS 6.—General amateur stations are restricted to a transmitting wavelength not exceeding 200 metres and a transformer input not exceeding 1 kw. (Sec. 4, Regulation 15, Act of August, 13th, 1912.)

66. CLASS 7.—Restricted amateur stations, within five nautical miles of a naval or military station, are restricted to a wavelength not exceeding 200 metres and to a transformer input not exceeding $\frac{1}{2}$ kW. (Sec. 4, Regulation 16, Act of August 13th, 1912.)

67. Amateur first or second grade operators or higher are required for general and restricted amateur stations.

68. The licence does not specify the number of operators required, but provides that the station shall at all times while in operation be under the care of an operator licensed for that purpose. The grade and number of operators as required by law is determined by the service of the station.

69. Special stations for exceptional distances are land stations designed to carry on trans-oceanic radio communication as between the United States and European countries, or between the Pacific coast and Hawaii, or from the United States over similar long distances at sea to another land station, or (inland) to carry on radio communication overland over exceptional distances. These stations will all come under one of the classifications named above and the licence will indicate the stations for which communication is authorised and indicate the range.

REGULATIONS COMMON TO LAND AND SHIP STATIONS.

70. Any change in the characteristics of the radio apparatus or service of the station must be authorised by the Secretary of Commerce.

71. Every land and ship station open to general public service shall have, as a part of the station equipment, a copy of the Official Berne List of Radiotelegraph Stations and supplements thereto, as issued to comply with section 2 of the Act of July 24th, 1910. Information concerning the use of this list and method of procuring it is given on page 72, paragraph 196.

72. The service regulations of the London Convention, Article VII, paragraphs 1 and 2b, require a reduction of power, or range under certain conditions. A proper resistance, impedance coil, or reactance regulator in the primary circuit is recommended. In certain cases the reduction of voltage or decreasing of coupling may be approved upon recommendations of radio inspectors.

73. Persons or corporations holding licences for radio stations, either land or ship, if practicable, must submit the licence to the radio inspector for the district, whenever the station or vessel goes out of commission for a period exceeding three months. The Commissioner of Navigation should be notified promptly of any

intention to suspend or discontinue the service of any commercial station.

74. If there is no intention to resume the same service or if the station or vessel will enter a different service from that indicated by the licence, the radio inspector will submit the licence to the Bureau, together with a statement of the facts. Otherwise the radio inspector may retain the licence in his files for safe keeping until the date of its expiration, when it will be forwarded to the Bureau for cancellation.

75. When the station goes into commission the owner may apply to the radio inspector for the return of the licence. The radio inspector will satisfy himself that the station corresponds to the schedule of the station as shown in the licence, and if so, the licence will be returned.

76. Stations desiring to conduct tests should communicate with the radio inspector by letter or telephone, stating the probable length of time that will be required. Stations conducting such tests or temporary experiments should "listen-in," to determine that no interference is being caused, and during the tests should "listen-in" frequently for the interference signal, "QRM." Stations conducting tests should transmit their official call signal frequently. Attention is invited to the Act of August 13th, 1912, section 5:

That every licence granted under the provisions of this Act for the operation or use of apparatus for radio communication shall prescribe that the operator thereof shall not wilfully or maliciously interfere with any other radio communication. Such interference shall be deemed a misdemeanour, and upon a conviction thereof the owner or operator, or both, shall be punishable by a fine not to exceed five hundred dollars or imprisonment for not to exceed one year, or both.

77. The Department holds that interference caused by tests of the character described above (par. 76) as "wilful" when no "listening-in" precautions are taken and the call signal of the station sending is not repeated at intervals.

APPLICATIONS FOR SHIP AND LAND STATION LICENCES, RENEWALS, AND DUPLICATES.

78. The Act does not apply either afloat or ashore to—

(a) Apparatus for radio communication which merely receives radiotelegrams and is not equipped for sending.

(b) Apparatus for the transmission of radiograms exclusively between points in the same State, if the effect of such transmission does not extend beyond the State (so as to interfere with the radio communication of other States), or if the effect of such transmission does not interfere with the reception of radiograms from beyond the State (so as to interfere with the interstate radio communication of that State).

(c) Apparatus for radio communication which has been issued to the Organised Militia by the War Department or to the Naval Militia by the Navy Department and is used for official purposes only.

79. The owner or operator of any apparatus who may be in doubt whether his apparatus under this paragraph is exempt from licence may write the facts to the radio inspector for his district before applying for a licence.

80. The apparatus for transmission of radiograms, or signals on any vessel of the United

States not permanently moored, requires a licence.

81. Apparatus for radio communication on land within the jurisdiction of the United States (excluding the Philippine Islands and excluding apparatus of the Government of the United States) must be licensed if—

(a) The apparatus is a means of commercial intercourse among the several States or with foreign nations; or

(b) The apparatus transmits radiograms or signals the effect of which at any time extends beyond the State; or

(c) The apparatus interferes with the receipt of messages in any State from beyond such State.

82. Station licences for the use and operation of apparatus for radio communication under the Act may be issued only to citizens of the United States or Porto Rico or to a company incorporated under the laws of some State or Territory of the United States or Porto Rico.

83. Licences can be issued to clubs if they are incorporated or if a member will accept the responsibility for the operation of the apparatus, carrying with it the possibility of being penalised for infraction of the laws.

84. Application for station licences of all classes should be addressed to the United States Radio Inspector for the district in which the station is located, who will forward the necessary blank forms and information. The limits of the districts and addresses of radio inspectors are given on page 68, paragraph 166.

85. Upon receipt of the forms, properly completed, the radio inspector will make a thorough inspection of the station if practicable.

86. When applications and forms have been properly submitted, ship and amateur stations may be operated in accordance with the laws and regulations governing the class of station for which application for licence has been made, until such time as the application can be acted upon, unless the applicant is otherwise instructed and provided temporary official call letters are assigned.

87. General and restricted amateur-station licences are issued directly by radio inspectors. Station licences of all other classes are issued from the office of the Commissioner of Navigation, Department of Commerce. Applications and forms are forwarded by radio inspectors and recommendations by them.

88. Stations desiring to operate different portions of the day under different classifications shall submit application for each service, giving exact hours for each. If approved, each classification will be specified in the licence.

89. The owner of an amateur station may operate his station in accordance with the laws if his application for a licence has been properly filed, but has not been acted upon. An application for an operator's licence must also have been filed, and every effort made to obtain the licence before the station may be operated.

90. "Provisional" station licences are issued to amateurs remote from the headquarters of the radio inspector of the district in which the station is located. These licences are issued as a matter of convenience and record. If, under inspection, the station is found to comply with the law, the inspector will strike out the word "Provisional" and insert the date of inspection and his signature at the bottom of the licence.

91. If such a station is found not to comply with the law the provisional licence may be cancelled until such time as the apparatus is readjusted to meet the requirements of the law: *Provided, however,* That consideration will be given to any reports of interference filed against such a station.

92. All persons are warned that it is unlawful to operate stations after licences have expired unless application for renewal has been properly made.

93. Owners desiring to renew licences must complete new forms as prescribed for original applications. Amateur-station licences issued on current forms may be renewed by the following endorsement on the back, provided no changes in the equipment or location have been made: otherwise a new licence will be issued: "This licence renewed for one year.

Radio Inspector." The Commissioner of Navigation will be notified of the name and call signal in every case of renewal in this manner.

94. Any person applying for a duplicate licence to replace an original which has been lost, mutilated, or destroyed will be required to submit an affidavit to the Bureau of Navigation through the radio inspector of the district, attesting the facts regarding the manner in which the original was lost. The Commissioner of Navigation will consider the facts in the case and advise the radio inspector in regard to the issue of a duplicate licence or a duplicate will be forwarded through the inspector's office.

95. A duplicate licence will be issued under the same serial number as the original and will be marked "Duplicate" in red across the face.

REGULATIONS GOVERNING RADIO OPERATORS.

CLASSES, GRADES AND REQUIREMENTS.

E 96. (1) Commercial extra first grade; (2) commercial first grade; (3) commercial second grade; (4) commercial cargo grade; (5) commercial temporary permit; (6) experiment and instruction grade; (7) amateur first-grade; (8) amateur second grade.

97. The Service Regulations of the International Convention require that "the service of the station on shipboard shall be carried on by a telegraph operator holding a certificate issued by the Government to which the vessel is subject."

98. Such certificates shall attest the professional efficiency of the operator as regards—

(a) Adjustment of the apparatus and knowledge of its functioning;

(b) Transmission and acoustic reception at the rate of not less than twenty words a minute (Continental Morse) for commercial first-grade operators and not less than twelve words per minute for second-grade operators;

(c) Knowledge of the regulations governing the exchange of wireless telegraph correspondence.

(d) The certificate shall furthermore state that the Government has bound the operator to secrecy with regard to the correspondence.

99. The International Convention has been ratified by the principal maritime nations, dominions and provinces. Radio operators holding valid certificates issued by foreign Governments which are parties to the convention will be recognised by this department as persons "skilled in the use of such apparatus" within the meaning of the Ac

unless in the case of a specific individual there may be special reason to doubt the operator's skill and reliability. Such certificates should be ready at hand for the inspection of radio inspectors or customs officers before the steamer departs from the United States.

100. In the case of a vessel subject to the Act under the flag of any nation not a party to the International Convention, the radio operator, before the departure of the vessel from the United States, must furnish to the inspector evidence that he is "skilled in the use of the apparatus." This evidence shall consist of an examination on board by the radio inspector.

101. *Commercial extra first class.*—The Department of Commerce will issue a special licence, to be known as commercial extra first grade, to radio operators whose trustworthiness and efficient service entitle them to confidence and recognition.

102. These licences will be given consideration by the Civil Service Commission in examination for positions requiring knowledge of radiotelegraphy, when experience is rated as a part of such examinations.

103. Applicants for the commercial extra first-grade licence must pass a special examination. To be eligible for this examination they must hold commercial first-grade licences, and their certificates of skill in radio communication, issued under the Act of June 24th, 1910, or licences under the Act of August 13th, 1912, must record eighteen months' satisfactory commercial service at sea or at land stations, either or both, during the two years previous to the filing of the application for examination, as shown by endorsement on the licence service records, or other satisfactory evidence, and provided that the applicants have not been penalised for a violation of the radio laws and regulations.

104. A speed of at least thirty words per minute Continental Morse, and twenty-five words per minute, American Morse (five letters to the word), must be attained. The technical questions and the questions on the radio laws and regulations will be considerably wider in scope than those for commercial first grade, and a higher percentage will be required.

105. All examination papers, including the code test sheets, will be marked and forwarded to the Commissioner of Navigation, with a recommendation by the radio inspector or examining officer. Examination papers will be marked upon the basis of 100, and licences will be recommended only if eighty or better is attained.

106. Licences of this grade will be issued by the Commissioner of Navigation, endorsed by the Secretary of Commerce, and delivered to the successful applicant through the examining officer.

107. *Commercial first class.*—The applicant must pass a satisfactory examination in—

(a) The adjustment, operation, and care of the apparatus, including correction of faults and change from one wavelength to another.

(b) Transmitting and receiving by ear at a speed of not less than twenty words a minute in Continental Morse (five letters to the word).

(c) Use and care of storage battery or other auxiliary power apparatus.

(d) Knowledge of the international regulations in force applying to radio communication.

(e) Knowledge of the requirements of the Acts of Congress to regulate radio communication (secs. 3, 4, 5, 6, and 7 of the Act of August 13th, 1912).

108. The commercial extra first grade and the commercial first grade licences qualify holders for employment at any ship or land station of any class.

109. *Commercial second class.*—The applicant must pass a satisfactory examination in all the subjects prescribed above for the first grade, with the exception that the minimum speed in transmitting and receiving shall not be less than twelve words a minute in Continental Morse, and the examination in the subjects will not be as comprehensive as that given first-grade operators.

110. *Commercial cargo grade.*—Section 2 of the Act of July 23rd, 1912, provides: "On cargo steamers, in lieu of the second operator provided for in this Act, there may be substituted a member of the crew or other person who shall be duly certified and entered in the ship's log as competent to receive and understand distress calls or other usual calls indicating danger, and to aid in maintaining a constant wireless watch so far as required for the safety of life."

111. The examination will be conducted so as to determine the following facts:

(a) That the applicant is sufficiently familiar with the Continental Morse Code to recognise the distress signal (SOS), when included in a list of other words or signals sent slowly. (approximately five words a minute).

(b) That the applicant is sufficiently familiar with the Continental Morse Code to recognise radio call letters of the vessel on which he desires to operate when sent slowly and repeated several times.

(c) That the applicant is sufficiently familiar with the type of the receiving apparatus of the vessel on which he desires to operate to determine by buzzer or similar test that the detector or receiving apparatus is properly adjusted to receive signals.

112. Examining officers and radio inspectors are authorised to issue a certificate, in the form of an amateur first-grade licence, after examination, to indicate the facts above enumerated in the case of a member of the crew or other person, and experience under this form will be credited by examining officers if the holder later applies for examination for a commercial licence. These licences will be marked "Cargo" in the upper right-hand corner under the serial number.

113. *Commercial temporary permit.*—Section 3 of the Act of August 13th, 1912, provides: "In case of emergency the Secretary of Commerce may authorise a collector of customs to issue a temporary permit, in lieu of a licence, to the operator on a vessel subject to the Radio Ship Act of June 24th, 1910."

114. The temporary permit, in the form of a letter to the operator, is to be issued only in cases of emergency and will be valid for one voyage from to beginning, unless the proper licence or properly licensed operator can be obtained en route.

115. The permits should be issued only to persons who the collector of customs has reason to believe are skilled in the use of the apparatus, but have not had the opportunity to present themselves for examination before

Government officers authorised to conduct examinations and furnish licences.

116. The collector of customs will forward to the Department of Commerce (Bureau of Navigation) a report covering each temporary permit issued and the reasons for its issue.

117. *Experiment and instruction grade.*—Experimenters and instructors of scientific attainments in the art of radio communication whose knowledge of the radio laws satisfies the radio inspector or the examining officer may obtain this grade licence, provided they are able to transmit and receive in the Continental Morse Code at a speed sufficient to enable them to recognise distress calls or the "keep-out" signals.

118. The operator's licence for this grade is a commercial licence, endorsed by the Secretary of Commerce with a statement of the special purpose for which it is valid.

119. If the applicant qualifies, the radio inspector or examining officer will forward the papers to the Commissioner of Navigation, with his recommendation. If approved, the licence will be properly endorsed by the Secretary of Commerce and delivered to the licensee through the recommending officer.

120. This licence has no reference to the instruction of radio operators as such, but is required by those operating apparatus licensed as experimental stations but who are unable to obtain commercial grade operators' licences.

121. Amateurs before applying for licences should read and understand the essential parts of the International Radiotelegraphic Convention in force and sections 3, 4, 5, and 7 of the Act of August 13th, 1912. The Department recognises that radio communication offers a wholesome form of instructive recreation for amateurs. At the same time its use for this purpose must observe strictly the rights of others to the uninterrupted use of apparatus for important public and commercial purposes. The Department will not knowingly issue a licence to an amateur who does not recognise and will not obey this principle. To this end the intelligent reading of the International Convention and the Act of Congress is prescribed as the first step to be taken by amateurs. A copy of the radio laws and regulations may be procured for this purpose from the radio inspectors or from the Commissioner of Navigation, Department of Commerce, Washington, D.C., but they are not for public distribution. Additional copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a nominal price.

MISCELLANEOUS.

June 28th, 1923.

General and restricted amateur radio station licences will be issued permitting the use of any type of transmitter (CW, spark, AC-CW, ICW, unfiltered CW, and phone), with the restriction that when using pure CW they are authorised to use wavelengths from 150 to 200 metres, and when using spark, AC-CW, ICW, unfiltered CW, and phone the wavelengths from 176 to 200 metres only can be used. The types of transmitters must be specified in the application and the licence. Special amateur radio station licences will be issued permitting the use of pure continuous wave transmitter only, authorising the use of wavelengths from 150 to 220 metres. For the purpose of application to amateur stations pure CW is defined, as follows: A system of telegraphing by continuous oscillations in which the power supply is substantially direct

current as obtained from (1) a generator, (2) a battery, or (3) a rectifier with an adequate filter. (A filter is not deemed adequate if the supply modulation exceeds 5 per cent.) General restricted and special amateur stations are not permitted to use a transformer input exceeding 1 kilowatt, or equivalent of this power-based upon watt input to plates if tubes are used. (Where input rating of tube is not specified by manufacturer this rating will be considered as double the manufacturers' output rating.)

On licences issued for amateur stations you will include the following: "This station is not licensed to transmit between the hours of 8 and 10.30 p.m., local standard time, nor Sunday mornings during local church services." Special amateur stations must be operated by persons holding an extra first-grade amateur operator's licence, or a commercial first-class operator's licence, or a commercial extra first-class operator's licence. Applicants must also meet the requirements of Regulation 63.

A new class of amateur operator's licence is hereby established to be known as "Amateur extra first grade." Licences of this grade will be issued to persons passing the required special examination with percentage of at least 75 and code speed in sending and receiving at least 20 words a minute, five characters to the word, who have had at least two years' experience as a licensed radio operator, and who have not been penalised for violation of the radio laws subsequent to the date of these regulations.

A. J. TYLER, *Acting Commissioner.*

Approved—

S. B. DAVIS, *Acting Secretary of Commerce.*

122. *Amateur first grade.*—The applicant must have a sufficient knowledge of the adjustment and operation of the apparatus which he wishes to operate and of the regulations of the International Convention and Acts of Congress in so far as they relate to interference with other radio communication and impose certain duties on all grades of operators. The applicant must be able to transmit and receive in Continental Morse at a speed sufficient to enable him to recognise distress calls or the official "keep-out" signals. A speed of at least ten words per minute (five letters to the word) must be attained.

123. *Amateur second grade.*—The requirements for the second grade will be the same as for the first grade. The second-grade licence will be issued only where an applicant cannot be personally examined or until he can be examined. An examining officer or radio inspector is authorised in his discretion to waive an actual examination of an applicant for an amateur licence, if the amateur for adequate reasons cannot present himself for examination but in writing can satisfy the examining officer or radio inspector that he is qualified to hold a licence and will conform to its obligations.

EXAMINATIONS.

124. The following requirements and method of conducting examination for radio operators' licences will be adopted at all examining offices.

125. The test shall consist of messages with call letters and regular preambles, conventional signals and abbreviations and odd phrases, and shall in no case consist of simple, connected reading matter. The test will be conducted by means of the omnigraph or other automatic instrument wherever possible.

126. The test shall continue for five minutes at a speed of twenty words, twelve words and ten words per minute, respectively, for the commercial first, second, and lower grades, and to qualify the applicant must receive twenty, twelve, or ten words in consecutive order.

127. The code test sheets written by the applicant will be forwarded to the Commissioner of Navigation with other papers and the speed attained noted in the lower left-hand corner of the first sheet.

128. An applicant will be given credit for the maximum speed he can attain.

129. The practical and theoretical examination shall consist of seven comprehensive questions under the following headings and values:

	Points, maximum value.
(a) Experience	20
(b) Diagram of receiving and transmitting apparatus	10
(c) Knowledge of transmitting apparatus	20
(d) Knowledge of receiving apparatus	20
(e) Knowledge of operation and care of storage batteries	10
(f) Knowledge of motors and generators	10
(g) Knowledge of international regulations governing radio communication and the United States radio laws and regulations	10

100

130. Seventy-five constitutes a passing mark for the first-grade commercial. Sixty-five constitutes a passing mark for the second-grade commercial.

131. Applicants who fail to attain twenty words in the code test but who attain a mark of between sixty-five and seventy-five in the written examination may be issued second-class licences, if they can receive at least twelve words per minute.

132. Question (a) shall determine the applicant's practical knowledge and experience in handling radio apparatus. An applicant's experience will be determined largely from the personal question sheet, and from satisfactory letters or references submitted. Experience, operating first-class amateur apparatus, or the apparatus provided in good training schools, will be given a reasonable value, but applicants who have had experience as apprentices at commercial shore stations or on board vessels will receive higher marks.

133. No applicant who fails to qualify will be re-examined at any examining office within three months from date of the previous examination. All examination papers, whether the applicant qualifies or not, will be forwarded to the Bureau of Navigation for filing as "Operator's record." When the records of the Bureau develop the fact that an applicant has failed to qualify and has applied for re-examination or been re-examined at the same or another office within three months, his existing licence may be suspended or revoked by the Secretary of Commerce. Applicants to whom are issued second-grade licences will not be examined for first-grade within three months under the same rule.

PLACES WHERE EXAMINATIONS ARE HELD.

134. (Excised.)

135. Naval radio stations: San Juan, P.R.; Colon, R.P.; Honolulu, H.T.

136. United States Army stations: Fort St. Michael, Alaska; Fort Valdez, Alaska.

137. Bureau of Navigation, Department of Commerce, Washington, D.C.

138. Radio inspectors, at their offices and elsewhere, by special arrangement.

139. Additional opportunities for taking the examination will be afforded as may be deemed necessary, and these special dates and places may be ascertained by communication with the Commissioner of Navigation, or nearest radio inspector.

140. All licences, when awarded, will be delivered through the officer who conducted the examination.

141. Examinations for the commercial extra first-grade licences will be held at the following offices only by appointment.

142. (Excised.)

143. United States radio inspectors, custom-houses: New Orleans, La.; San Francisco; Cal.; Seattle, Wash.; Chicago, Ill.; Boston, Mass.; New York, N.Y.; Baltimore, Md.; Detroit, Mich.; Norfolk, Va.; Atlanta, Ga.

144. Commissioner of Navigation, Department of Commerce, Washington, D.C.

145. In special cases, upon application to the Commissioner of Navigation, arrangements may be made for examinations at other points.

APPLICATIONS FOR EXAMINATIONS FOR RADIO OPERATORS' LICENCES, RENEWALS, AND DUPLICATES.

146. An operator's licence may be granted to any person without regard to sex, nationality or age if the applicant can fulfil the requirements for the class of licence desired.

147. Applicants for licences should communicate in writing with the commandants, commanding officers, or officers in charge at navy yards, and army posts, with the Commissioner of Navigation, or radio inspectors, in order to fix the date when they can be examined. (See pars. 134-145.)

148. Commercial licences can only be obtained by personal examination. Where applicants are at remote points or cannot proceed to examining offices, efforts will be made to examine them through radio inspectors when they are in that vicinity, but special trips cannot be made for that purpose.

149. Amateurs should write to the nearest examining officer in their vicinity (see pars. 134-145) for Form 756 (application for operator's licence) and to the radio inspector in their vicinity for Form 762 (application for licence for land station). If the application for operator's licence is also made to the radio inspector, both applications should be forwarded in the same envelope.

150. Amateur operators at points remote from examining officers and radio inspectors may be issued second-grade amateur licences without personal examination. Examinations for first-grade licences will be given by the radio inspector when he is in that vicinity, but special trips cannot be made for this purpose (see par. 123).

151. Persons holding radio operator's licences, amateur second grade, should make every effort to appear at one of the examination points to take the examination for amateur first-grade licence or higher.

152. Persons holding radio operator's licences of any class or grade should, before their licences expire, apply to the nearest radio inspector or examining officer for renewal and submit Form 756 in duplicate.

153. Radio operators of the commercial class or cargo grade whose licences show on the service records satisfactory service for three months out of the last six months of the licence term may be issued new licences without re-examination. Other operators who submit satisfactory evidence to the examining officer, showing actual operations of radio apparatus for three months during the last six months of the licence term, may be issued new licences without re-examination. All others will be re-examined in the usual manner.

154. Whether or not a new licence is issued, the radio inspector or examining officer will forward one copy of Form 756, properly completed, to the Commissioner of Navigation, Department of Commerce. If a new licence is not issued, the reason therefor will be stated on the back of the form.

155. Any operator applying for a duplicate licence to replace an original which has been lost, mutilated, or destroyed, will be required to submit an affidavit to the Bureau of Navigation through the radio inspector or examining officer who issued the original, attesting the facts regarding the manner in which the original was lost. The Commissioner of Navigation will consider the facts in the case and advise the radio inspector in regard to the issue of a duplicate licence. A duplicate licence will be issued under the same serial number as the original and will be marked "Duplicate" in red across the face.

156. Operators' licences are not valid until the oath for the preservation of the secrecy of messages is properly executed before a notary public or other officer duly authorised to administer oaths. Licences must indicate on their faces that the oath has been taken and the officer administering the oath on the back of the licence should sign also in the blank provided on the face.

157. Operators' licences should be framed and posted in the radio room, and licences for stations should be accessible at all times to inspectors.

158. Under the supervision of a licensed operator an apprentice or unlicensed person may learn the art by the actual use of the apparatus, but the licensed operator who fails to enforce obedience to the regulations by the apprentice or unlicensed person serving under his supervision is liable to penalties as if he had himself violated the regulations.

159. An individual record is kept in the Bureau of Navigation, Department of Commerce, at Washington, of each licensed operator. Each operator's examination papers and all reports in regard to interference or violations of the radio laws and regulations are filed for reference.

160. Radio operators holding licences of any grade or class and applying for examination for any other grade or class must submit to the examining officer Form 756, in duplicate. If a new licence is issued the licence held by the applicant must be surrendered.

161. Radio operators who pass the examination for a higher class or grade licence are required to surrender their existing licences, which will be forwarded to the Commissioner of Navigation with the other papers.

162. Operators desiring to retain their expired or cancelled licences may make application therefor to the Commissioner of Navigation.

GENERAL INFORMATION.

ADMINISTRATION AND ADMINISTRATIVE DISTRICTS.

F 163. The Department has established, for the purpose of enforcing, through radio inspectors and others, the acts relating to radio communication and the International Convention, the following districts, with the principal office for each district at the custom house of the port named.

164. Communications for radio inspectors should be addressed as follows, and not to individuals: Radio Inspector, Customhouse, (city), (State),

165. Communications for the Bureau of Navigation should be addressed as follows, and not to individuals: Commissioner of Navigation, Department of Commerce, Washington, D.C.

166. (1) BOSTON, MASS.: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut.

(2) NEW YORK, N.Y.: New York (county of New York, Staten Island, Long Island, and counties on the Hudson River to and including Schenectady, Albany, and Rensselaer) and New Jersey (Counties of Bergen, Passaic, Essex, Union, Middlesex, Monmouth, Hudson, and Ocean).

(3) BALTIMORE, MD.: New Jersey (all counties not included in second district), Pennsylvania (counties of Philadelphia, Delaware, all counties south of the Blue Mountains, and Franklin County), Delaware, Maryland, Virginia, District of Columbia.

(4) SAVANNAH, GA.: North Carolina, South Carolina, Georgia, Florida, Porto Rico.

(5) NEW ORLEANS, LA.: Alabama, Mississippi, Louisiana, Texas, Tennessee, Arkansas, Oklahoma, New Mexico.

(6) SAN FRANCISCO, CAL.: California, Hawaii, Nevada, Utah, Arizona.

(7) SEATTLE, WASH.: Oregon, Washington, Alaska, Idaho, Montana, Wyoming.

(8) DETROIT, MICH.: New York (all counties not included in second district), Pennsylvania (all counties not included in third district), West Virginia, Ohio, Michigan (Lower Peninsula).

(9) CHICAGO, ILL.: Indiana, Illinois, Wisconsin, Michigan (Upper Peninsula), Minnesota, Kentucky, Missouri, Kansas, Colorado, Iowa, Nebraska, South Dakota, North Dakota.

REPORTING OF VIOLATIONS.

167. The regulations established by law, or by the authority of law, or of the International Convention, will be enforced by the Secretary of Commerce through collectors of customs, radio inspectors, and other officers of the Government.

168. The service regulations of the radiotelegraphic Convention in force provide that "no station on shipboard shall be established or worked by private enterprise without authority from the Government to which the vessel is subject." Such authority shall be in the nature of a licence issued by said Government. Stations on foreign ships will be licensed by their Governments respectively. Inspectors will report to the Commissioner of Navigation stations on foreign ships not so licensed.

169. A radio inspector is authorised in exceptional cases to act outside of his district for the convenience of commerce. In such cases he will communicate before or after acting with the inspector in whose district he has acted. Radio inspectors are authorised to

communicate directly with collectors of customs and to co-operate with them in the enforcement of the law.

170. Violations of the laws and regulations will be reported to the chief customs officer of the district in which the offence occurs, who will report the case to the Secretary of Commerce (Bureau of Navigation), according to the procedure followed in violations of the navigation laws. Misdemeanours will be reported to the United States district attorney in the usual manner.

171. Collectors of customs and radio inspectors are enjoined that the reports required by paragraph 170 must be precise statements of the facts as the basis for possible proceedings by the United States attorney.

172. Violations by the master of a vessel of the United States of the provisions of the second paragraph of section 1 of the ship act will be reported to the collector of customs directly, and the usual procedure in cases of fines and penalties will be followed.

INSPECTION OF SHIP STATIONS.

173. The radio inspectors and customs officers, as far as practicable shall visit steamers subject to the act before they leave port and ascertain if they are equipped with the apparatus in charge of the operators prescribed by law and regulation.

174. When the radio apparatus is certified as complying with the requirements of law by the competent authorities of a foreign Government, such certificate will be recognised by this Department, but the radio inspector or customs officer may, if he deem it necessary or desirable, satisfy himself that the apparatus is in good working order.

175. Whenever practicable the radio inspector shall satisfy himself on his visit before the departure of a steamer subject to the act of July 23rd, 1912, that the apparatus is efficient and in good working order within the meaning of the Act, and if satisfied he shall issue a certificate in the form of Appendix A (form 752). The duplicate of these certificates will be filed with the collector of customs as a record of the radio equipment on vessels sailing from his port.

176. These certificates will be issued only if the inspection is made within two hours of sailing time.

177. For each clearance the master of a steamer coming under the Act of July 23rd, 1912, is required to furnish to the customs officer a certificate in the form in Appendix B (Form 753). Such certificate shall be retained in the files of the collector of customs. Whenever the radio inspector is absent from his home port he will notify the collector of customs, who will arrange for the collection of certificates and survey of equipment.

178. When a steamer subject to the radio law is without the apparatus and the operators prescribed, or either of them, and is about to attempt to leave port, the radio inspector or customs officer visiting the vessel shall:

(a) Furnish the master with a memorandum (stub of Form 771) of the particulars in respect of which the law has not been complied with and the penalty;

(b) If convenient, notify the vessel's agents or the proper person in charge of the apparatus so that the necessary corrections may be made before sailing.

179. If a steamer clears in violation of the law the radio inspector or customs officer shall submit to the collector of customs of the port a written report, stating the exact nature

of the violation, the section of the law violated, and the penalties involved and all of the circumstances in connection therewith which will be of service to the collector and to the Secretary of Commerce in determining what action shall be taken. A copy of the report will be forwarded to the Commissioner of Navigation.

180. Statements should be obtained from operators, ships officers, or other witnesses at the time the violation is discovered and should accompany the report to the collector of customs.

181. The collector of customs will report the case to the Secretary of Commerce in the usual manner as a navigation fine case.

182. Merchant vessels chartered by the United States Government are subject to the Act of August 13th, 1912, in every case, if the radio apparatus is owned and operated by a commercial company.

183. Merchant vessels chartered by the United States Government for the transportation of persons or supplies are subject to the requirements of the ship act (Act of July 23rd, 1912), if the vessel is controlled and operated by the owners. Vessels commanded wholly or in part by Government officers are not subject to the ship act.

184. Government vessels or vessels chartered by the Government are subject to the act of August 13th, 1912, if the radio equipment is owned and operated by private interests.

185. The ship act does not authorise the refusal of clearance in case of violation of its provisions, but specifically provides for the imposition of a fine in a sum not more than \$5,000.

186. The act does not apply to a vessel at the time of entering a port of the United States. Radio inspectors and customs officers may, however, accept as evidence of the efficiency of the operators and the skill of an operator messages shown to have been transmitted and received by him over a distance of at least 100 miles, by day, during the voyage to the United States.

OPERATORS ON FOREIGN VESSELS.

187. In so far as licensed operators are concerned a sharp distinction should be drawn between the Act of July 23rd, 1912, which requires apparatus and operators for radio communication on steamers and the Act of August 13th, 1912, to regulate radio communication.

188. The Act of July 23rd, 1912, amending the Act of June 24th, 1910, is designed to promote safety at sea through the employment of apparatus and operators to transmit and receive distress calls and other calls relating to perils and aids to navigation. It provides that in the case of American and foreign vessels subject to its provisions "the radio equipment must be in charge of two or more persons skilled in the use of such apparatus." This Act does not require that the operators shall be licensed, and the penalty prescribed in section 3 of the Act is not incurred by the master of a vessel whose operators are "skilled in the use of such apparatus," even though they may not be licensed.

189. The Act of August 13th, 1912, is designed to execute on behalf of the United States the International Radiotelegraphic Convention and thus to promote orderly exchanges by radio communication. For this purpose the International Radiotelegraphic Convention (Service Regulations) provides that the service of the station on shipboard shall be carried on by a telegraph operator

holding a certificate issued by the Government to which the vessel is subject.

190. Section 3 of the Act of August 13th, 1912, carries out this provision of the International Convention by providing licences for operators on American vessels. If an unlicensed person serves in charge or in supervision of the use and operation of the apparatus both he and his employer are liable to a fine of not more than \$100 or imprisonment for not more than two months or both. This section and penalty do not apply to operators on foreign ships. But operators on the ships of foreign nations signatory to the International Radiotelegraphic Convention, as shown above, are required to have certificates or licences from their own Governments, and if not so certificated, the obligations of the convention have not been observed. The convention in the Service Regulations provides for this situation.

191. The Act of July 23rd, 1912, as stated, requires that on American and foreign ships the operators must be "skilled in the use of such apparatus," but does not require that they must be licensed. To facilitate commerce and simplify administration, operators presenting American licences or foreign certificates are accepted as "skilled in the use of such apparatus," except where there may be special reasons to doubt the operator's skill or reliability. Where operators on American or foreign ships do not have such licences or foreign certificates, radio inspectors or customs officers under the Act of July 23rd, 1912, may accept other competent evidence of skill or may examine such operators.

OFFICIAL INTERNATIONAL LIST OF COAST AND SHIP RADIO STATIONS OF THE WORLD AND STATION RATES.

192. The list of land and ship stations of the United States including amateurs, giving call letters, wavelengths, nature of service, etc. can be procured from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a nominal price.

193. Supplements to this list are issued monthly and the list is revised annually, as of July 1st. Information concerning amateur stations will not be included in the supplements, but in the annual edition only.

194. The introduction to the list of "Radio Stations of the United States" contains information concerning the assignment of international and amateur call letters.

195. A copy of the Official Berne List, and supplements as issued, are required as a part of the equipment of every station open to general public service.

196. The International List of Radio Stations of the World (edition in English) can be procured from the International Bureau of the Telegraphic Union (Radiotelegraphic Service), Berne, Switzerland.

197. In addition to the information contained in the pamphlet of the United States stations, published by the Bureau of Navigation, the international list shows geographical locations, normal ranges in nautical miles, radio systems and rates.

198. The international list includes the Government and commercial land and ship stations of the United States. The list is divided into three parts. The first part contains a list of ship stations, grouped by countries and arranged alphabetically; the

second part contains a list of land stations arranged in the same manner; and the third part contains tables of land line and cable charges from coast radio stations to inland and various other points. In computing the total word rate applicable to a radiogram from a ship station to an inland point or *vice versa*, the three rates must be added. The rates in the international list are stated in francs. For approximate purposes 1 franc equals 20 cents and 5 centimes equals 1 cent. Supplements to the international list will be issued monthly, and will contain new stations and tables of alterations.

199. The International Alphabetical List of Call Letters (stations of the world) is also issued by the international bureau at Berne, and supplements will be issued monthly.

200. Neither the international list proper nor the supplements will contain a list of amateur stations.

201. Inquiries as to the subscription price of these lists should be made direct to the Berne bureau, at the address given above, (See par. 196.) Remittances to Berne should be made by international postal money order.

MISCELLANEOUS INFORMATION.

202. Stations equipped to receive only do not require licences.

203. Operators of receiving stations do not require licences, but *all persons* are required to maintain secrecy in regard to messages, as provided in the Act of August 13th, 1912, nineteenth regulation of section 4.

204. Distances under the radio laws are computed in nautical miles.

205. No fees are charged for any operator or station licence.

206. Licensed stations must be operated by or under the direct supervision of properly licensed operators.

207. Amateur stations within five miles of naval or military stations need not have been in actual operation on or before August 13th, 1912, to obtain a licence for a restricted amateur station.

208. The master of a vessel shall have the right to censor all messages addressed to or transmitted by a radio telegraph station on board his vessel, but such master shall not divulge to any person (other than the properly authorised officials of the Government, or a competent legal tribunal) or make any use whatever of any message coming to his knowledge through the exercise of such censorship nor shall the master or any operator divulge to any person (other than the properly authorised officials of the Government, or a competent legal tribunal) or make any use whatever of any message (other than a message of distress) coming to his knowledge and not intended for the said station.

209. The transmission of superfluous signals by any ship or coast station is absolutely prohibited; trials and practices are forbidden except under such circumstances as to preclude the possibility of interference with other stations.

210. No person shall transmit or make a signal containing profane or obscene words or language.

211. Additional or amendatory regulations will be issued from time to time as they may appear necessary.

Radio Service Form 752.

CERTIFICATE OF RADIO INSPECTION.
PORT OF

19
G This is to certify that I have to-day examined the apparatus for radio communication on the s.s. _____ of which _____ is master, about to leave this port for _____, and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed)

Radio Inspector.

(Or)

Customs Inspector.

Radio Service Form 753.

MASTER'S CERTIFICATE OF RADIO APPARATUS.

NOTICE.

H The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regarded by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators and watches, shall subject him to a penalty of one hundred dollars. (Act of July 23rd, 1912.)

PORT OF

19..

This is to certify that I have to-day examined the apparatus for radio communication on the S.S. _____, of which I am master, about to leave this port for _____, and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed)

Master.

No.

RADIO SERVICE FORM 753A
RADIO DECLARATION.

(To be submitted in duplicate.)

I NOTICE—"The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars."—Act of July 23rd, 1912.

Port of
Date....., 19..

This is to certify that the (nationality)
s.s. of the (name of company or line) of which I am master, entered this port on 19.. having in crew (number) persons

and licensed or certificated to carry (number) passengers; that the said vessel (is/is not) * equipped with radio apparatus as required by the Act of June 24th, 1910, as amended July 23rd, 1912; that the radio station is in charge of (number) properly licensed radio operators and the apparatus is

Master or Agent.

in efficient/inefficient † condition.

This form should be filed in duplicate with the Collector of Customs at time of entry, who will furnish one copy to the radio inspector of the district on the date of entry in order that proper inspection may be made of the radio apparatus prior to the clearance of the vessel.

RADIO FORM 753B.

MASTER'S CERTIFICATE OF RADIO APPARATUS.

J NOTICE—"The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars."—Act of July 23rd, 1912.

CLEARANCE.

Port of
..... 19..

This is to certify that I have to-day examined the apparatus for radio communication on the (nationality) s.s.

of which I am master, about to leave this port for and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed)
Master.

LICENCE FOR GENERAL PUBLIC SERVICE COAST RADIO STATION.
DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION.

RADIO SERVICE.

K Pursuant to the Act, to regulate radio communication, approved August 13th, 1912, _____, a citizen of the State of _____

..... a company incorporated under the laws of the State of _____ having applied therefor, is hereby granted by the Secretary of Commerce for a period of _____ on and subject to the restrictions and conditions hereinafter stated and revocable for cause

* Strike out is or is not as the case may be.

† Strike out efficient or inefficient as the case may be.

by him, this licence to use or operate the apparatus for radio communication (identified in the schedule hereinafter) located in the State of _____ city or town of _____, for the purpose ship of transmitting to and receiving from stations and other land stations general public correspondence, Government and service correspondence, and distress signals and messages, at rates of compensation not in excess of those fixed by the international agreement to which the government of the United States has adhered, which have been submitted to and approved by the Secretary of Commerce, as included in the schedule hereinafter.

2. The use or operation of apparatus for radio communication pursuant to this licence shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President "to the end that the same and every article and clause thereof may be observed and fulfilled with good faith by the United States and the citizens thereof, and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States."

3. The authority conferred by this licence is subject to the provisions of the Act of February 4th, 1887, entitled "An Act to regulate commerce," as amended by the Act of June 18th, 1910, so far as the licence may be within the operation of said Act, and except as provided in the Act of August 13th 1912, or in the International Radiotelegraphic Convention and regulations made part thereof, the station shall transmit all messages offered by those who tender lawful rates on equal terms without discrimination, whether as regards rates, order of transmission, or otherwise.

4. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

5. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

6. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, shall refrain from sending until all signals and radiograms relating thereto are completed.

7. The station during the hours of operation shall listen-in at intervals of not less than 15 minutes and for a period of not less than two minutes with the receiver tuned to receive messages of 300 metres wavelength.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall exchange radiograms with any other commercial station and with any ship station without distinction of the radio systems adopted by such stations.

10. The station shall not use a transmitter during the first 15 minutes of each hour, local standard time, except for distress signals, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of time, pursuant to the Twelfth Regulation by the Act of August 13th, 1912.

11. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

12. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

13. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Location : State, _____, County _____; City or Town, _____ Street, _____; No. _____
 Geographical location : Latitude, N. ° ' " Longitude, W. ° ' "
 Specific hours authorised during which the station must be open to service (local standard time) : _____
 Power : Transformer input, _____ kW.
 Normal day range in nautical miles with ships at sea _____
 Time and method, if any, of sending time signals and hydrographic and meteorological radiograms : _____
 Call letters _____
 _____; Coast charges : per word _____ minimum per radiogram _____
 _____; Coast charges : per word _____ minimum per radiogram _____
 _____; Coast charges : per word _____ minimum per radiogram _____
 Radiotelegraphic system employed _____
 Characteristics of transmitting system :
 Type of spark gap, _____
 Approximate spark frequency, _____
 Characteristics of receiving system :
 Type of receiver, _____
 Wavelength of receiving system : From _____ metres to _____ metres.
 Antenna : Number of masts, _____; Height, _____

Type of aerial,
Wires: Number,; Size and
kind,
Essential dimensions,
.....

Sending wave-length.*	Antenna current (amperes).	Logarithmic decrement.
600 metres		
300 metres		
metres		
metres		
metres		

* Underscore normal.

The station insures rapid exchange with land wire stations of the
(Company.)
(Location telegraph office.)
(Company.)
(Location telegraph office.)
in the following manner:
Satisfactory proof has been furnished that the station was actually operating August 13th, 1912.
This licence will expire on the day of 19...
Secretary of Commerce.
Commissioner of Navigation.
Washington, D.C. 19....

INSPECTIONS.

Date.	Inspector.	Remarks.

WAVELENGTHS.

The normal sending and receiving wave-length shall be metres, and no other wavelength shall be used for general public correspondence with any foreign ship or foreign coast station, except for long-range public service or purposes other than general public correspondence.
The station shall at all times, except as provided in the seventh paragraph of this licence, be ready to receive messages of such wavelengths as are required by the International Radiotelegraphic Convention; shall be prepared to use two sending wavelengths, one of 300 metres and one of 600 metres, as required by the International Radiotelegraphic Convention in force; and tuning positions on the receiver shall be plainly marked: Provided, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservations to accord with any international agreement to which the United States is a party.

No.
LICENCE FOR SHIP RADIO STATION.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.
RADIO SERVICE.

L Pursuant to the Act to regulate radio communication, approved August 13th, 1912
a citizen of the State of
For long-range public service and for any service other than general public correspondence the station is authorised to use the following additional wavelength under 600 or over 1,600 metres:
Metres,; Metres,; Metres,
Metres,; Metres,
The energy, if radiated by the transmitter in two or more wavelengths as indicated by a sensitive wavemeter, shall not in any one of the lesser waves exceed 10 per cent. of that in the greatest; and the logarithmic decrement per complete oscillation in the wave trains shall not exceed two-tenths, except when sending signals or messages relating to vessels in distress.
.....
a company incorporated under the laws of the State of having applied therefor, is hereby granted by the Secretary of Commerce for a period of on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this licence to use or operate the apparatus for radio communication (identified in the schedule hereinafter) on the called..
(Type of vessel.)
..... vessel of the....

(Name of vessel.)
United States, official number for the purpose of transmitting to and receiving from other ship stations and land stations general public correspondence, Government and service correspondence, and distress signals and messages, at rates of compensation not in excess of those fixed by the International Agreement to which the Government of the United States has adhered, which have been submitted to and approved by the Secretary of Commerce, as included in the schedule hereinafter.

2. The use or operation of apparatus for radio communication pursuant to this licence shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President "to the end that the same and every article and clause thereof may be observed and fulfilled with good faith by the United States and citizens thereof," and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States.

3. The authority conferred by this licence is subject to the provisions of the act of February 4th, 1887, entitled "An Act to Regulate Commerce," as amended by the Act of June 18th, 1910, so far as the licensee may be within the operation of said Act, and except as provided in the Act of August 13th, 1912, or in the International Radiotelegraphic Convention and regulations made part thereof, the station shall transmit all messages offered by those who tender lawful rates on equal terms

without discrimination, whether as regards rates, order of transmission, or otherwise.

4. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations, and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

5. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, except when in case of emergency the Collector of Customs by authority of the Secretary of Commerce shall issue a temporary permit, in lieu of a licence, to the operator. The operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

6. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress shall refrain from sending until all signals and radiograms relating thereto are completed.

7. The station shall be prepared to send the international signal of distress and distress signals on the normal wavelength designated by the International Radiotelegraphic Convention in force with sufficient power to enable them to be received by day over sea a distance of 100 nautical miles by a ship station equipped with apparatus for sending and receiving equal in all essential particulars to the apparatus of the station herein licensed.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall exchange radiograms with any other ship station without distinction of the radio systems adopted by such stations.

10. The station shall not use, except for sending signals of distress or signals and radiograms relating thereto, or when, owing to unusual circumstances, communication can be established only by means of an increase of power, a transformer input exceeding 1 kW., or exceeding $\frac{1}{2}$ kW. when within five nautical miles of a naval or military station.

11. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus, or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

12. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting, and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

13. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Ship: Name,; Owner,; Home port,; International Code letters,
 Radio call letters :.....
 Nature of service :.....
 Hours of operation :.....
 Power: Transformer input, kW.
 Primary source of power,.....
 Normal day range in nautical miles with other ships at sea,.....
 Ship charge: Per word,; Minimum per radiogram.....
 Per word; Minimum per radiogram.....
 Radiotelegraphic system employed :.....
 Characteristics of transmitting system :
 Type of spark gap.....
 Approximate spark frequency,.....
 Characteristics of receiving system :
 Type of receiver,.....
 Wavelength range of receiving system :
 From metres to metres.....
 Antenna : Number of masts,
 Height.....
 Type of aerial.....
 Wires: Number,; Size and kind,.....
 Essential dimensions,.....
 Auxiliary apparatus: Type.....
 Power: Source,; Normal day range with ships,.....

Sending wavelength.*	Antenna current (amperes).	Logarithmic decrement.
600 metres		
300 metres		
metres		
metres		
metres		

*Underscore normal.

WAVELENGTHS.

The normal sending and receiving wavelength shall be 600 metres, and the station shall be prepared to use two sending wavelengths, one of 600 metres and one of 300 metres, as required by the International Radiotelegraphic Convention in force; and tuning positions shall be plainly marked: Provided, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservations to accord with any international agreement to which the United States is a party.

A wavelength of metres and the following additional wavelengths not exceeding 600 metres may be employed as authorised by law and treaty:

Metres,; Metres,; Metres,
 Metres,; Metres,; Metres,
 Metres,; Metres,

The energy if radiated by the transmitter in two or more wavelengths as indicated by a sensitive wavemeter, shall not in any one of the lesser waves exceed 10 per cent. of that in the greatest; and the logarithmic decrement per complete oscillation in the wave trains shall not exceed two-tenths, except when sending signals or messages relating to vessels

in distress and in sending distress signals when the transmitter may be tuned to create a maximum of interference with a maximum of radiation.

The station in general shall transmit its radiograms to the nearest coast station. The sender shall have the right, however, to designate the coast station through which he desires to have his radiograms transmitted, and his wishes shall be complied with only if the transmission can be effected without interfering with the service of other stations, or the shipboard station shall wait until such coast station shall be the nearest as provided by the International Convention in force.

Satisfactory proof has been furnished that the station was actually operating August 13th, 1912.

This licence will expire on the
day of 19

[SEAL.] Secretary of Commerce.
Commissioner of Navigation.
Washington, D.C., 19

INSPECTIONS.

Date.	Inspector.	Remarks.

No.

LICENCE FOR LAND RADIO STATION.
Class
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.
RADIO SERVICE.

M Pursuant to the Act to regulate radio communication, approved August 13th, 1912, a citizen of the State of a company incorporated under the laws of the State of , having applied therefor, is hereby granted by the Secretary of Commerce for a period of on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this licence to use or operate the apparatus for radio communication (identified in the schedule hereinafter) for the purpose of transmitting to and receiving from ship stations and other land stations public correspondence, Government and service correspondence, and distress signals and messages at rates of compensation not in excess of those fixed by the international agreement to which the Government of the United States has adhered, which have been submitted to and approved by the Secretary of Commerce, as included in the schedule hereinafter, or for the purpose of conducting experiments for the development of the science of radio communication or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours and under such conditions as will insure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations, the purpose of the station being designated by the classification at the head of this licence.

2. Public correspondence or limited commercial correspondence authorised by this licence shall be limited to certain stations, ships or lines of ships named hereinafter, which designation is authorised in view of the nature of the service and is independent of the radio system employed.

3. The use or operation of apparatus for radio communication pursuant to this licence shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President, and shall be subject also to such regulations as may be established from time to time by authority of subsequent Acts and treaties of the United States, in so far as they apply to the class of station indicated by this licence.

4. The authority conferred by this licence is subject to the provisions of the Act of February 4th, 1887, entitled "An Act to Regulate Commerce," as amended by the Act of June 18th, 1910, so far as the licensee may be within the operation of said Act, and except as provided in the Act of August 13th, 1912, or in the International Radiotelegraphic Convention and regulations made part thereof, the station shall transmit all messages offered by those who tender lawful rates on equal terms without discrimination, whether as regards rates, order of transmission, or otherwise.

5. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations, and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

6. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

7. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, shall refrain from sending until all signals and radiograms relating thereto are completed.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall not use a transmitter during the first fifteen minutes of each hour, local standard time, except for distress signals, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of time, pursuant to the Regulation 12 of the Act of August 13th, 1912.

10. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus, or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

11. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

12. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Name of owner
Location: State,; County,; City or town,; Street,; No.

Geographical location: Latitude, N. ...° ...' ..."; Longitude, W. ...° ...' ..."

This station is licensed for communication only with the following land stations, ships, or lines of ships:

Specific hours during which the station must/may be open to service (local standard time):

Power: Transformer input, kW.
Normal day range in nautical miles,
Time and method, if any, of sending time signals and hydrographic and meteorological radiograms:

Call letters,
.....; Coast charges: per word; minimum per radiogram
.....; Coast charges: per word; minimum per radiogram
.....; Coast charges: per word; minimum per radiogram

Radiotelegraphic system employed,
Characteristics of transmitting system:
Type of spark gap,
Approximate spark frequency,

Wavelength range of receiving system:
From metres to metres.

Antenna: Number of masts,
Height,,,

Type of aerial,
Wires: Number,; Size and kind,

Essential dimensions,
.....

WAVELENGTHS.

The normal sending and receiving wavelength shall be metres.

If the station be classified as a coast station, it shall be prepared to transmit or relay distress calls or messages using the distress wavelength as provided by the International Radiotelegraphic Convention in force.

In view of special conditions the station is authorised to use for communication exclusively with stations licensed by the United States the

following additional wavelengths under 600 or over 1,600 metres:

Metres,; Metres,; Metres,; Metres,

The energy, if radiated by the transmitter in two or more wavelengths indicated by a sensitive wavemeter, shall not in any one of the lesser waves exceed 10 per cent. of that in the greatest; and the logarithmic decrement per complete oscillation in the wave trains shall not exceed two-tenths, except when sending signals or messages relating to vessels in distress.

The station insures rapid exchange with land wire stations at

.....
(Company.)

.....
(Location telegraph office.)

Sending wavelength.	Antenna current (amperes).	Logarithmic decrement.
300 metres		
600 metres		
metres		
metres		
metres		

.....
(Company.)

.....
(Location telegraph office.)

in the following manner:

This licence will expire on the day of, 19..

[SEAL OF DEPARTMENT OF COMMERCE.]

Secretary of Commerce.
Commission of Navigation.
Washington, D.C., 19..

INSPECTIONS.

Date.	Inspector.	Remarks.

Form 765a. ORIGINAL.

Official Call..... Number.....

LICENCE FOR SPECIAL AMATEUR RADIO STATION.

DEPARTMENT OF COMMERCE—BUREAU OF NAVIGATION—RADIO SERVICE.

N Pursuant to the Act to regulate radio communication, approved August 13th, 1912,, a citizen of the State of county of city or town street No. having applied therefor, is hereby granted by the Secretary of Commerce, for a period of year, on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this licence to use or operate the apparatus for radio communication (identified in the Schedule hereinafter) for the purpose of transmitting private radiograms or signals, notwithstanding the effect thereof extends beyond the jurisdiction of the State or Territory in which the said

station is located: *Provided*, That no interference other than may result under the restrictions contained in this licence shall be caused with the radio communication of stations of the Government of the United States or licensed stations.

2. The use or operation of apparatus for radio communication pursuant to this licence shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States, and caused to be made public by the President, and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States.

3. The apparatus shall at all times while in use and operation be in charge of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

4. The station shall give absolute priority to signals or radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and shall refrain from sending until all the signals and radiograms relating thereto are completed.

5. The station shall use the minimum amount of energy necessary to carry out any communication desired, and the tube input shall not exceed 1,000 watts.

6. The station shall not use a transmitting wavelength exceeding 220 metres.*

7. The station shall not use a transmitter during the first 15 minutes of each hour, local standard time, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of the time, pursuant to the Twelfth Regulation of the Act of August 13th, 1912.

8. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus, or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

9. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting, and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

10. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following Schedule except with the approval of a radio inspector, or other duly authorised officer of the Government.

Name of naval or military station, if within five nautical miles..... W.

Power: Tube Output..... W.

Antenna: Type (T, J, etc.).....

Height.....

(Above ground.)

* On account of the trouble caused by amateurs transmitting on the same wavelengths as those used for broadcasting concerts, the Government has limited the wavelengths which may be used by amateur experimenters to 150 to 200 metres for pure C.W., and 176 to 200 metres for chopped C.W. or damped waves. A special licence will be granted to amateurs holding an extra first-class certificate and having at least two years' experience, or to those holding commercial radiotelegraphists licences, whereby they will be privileged to use wavelengths of 150 to 220 metres.

Horizontal length
Wires: Number in vertical part.....
In Horizontal part.....
The sending wavelengths shall be 150 to 220 metres and the station is authorised to use any wavelength within this band.

This Licence expires on..... 192..

HERBERT HOOVER,

D. B. CARSON, Secretary of Commerce.

Commissioner of Navigation.

Delivered by.....

Supervisor of Radio.

Place.....

Date 192..

THE UNITED STATES OF AMERICA.

DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION.

LICENCE TO RADIO OPERATOR, COMMERCIAL EXTRA FIRST CLASS.

O This is to certify that
has been examined and passed,
pursuant to the Radiotelegraphic
Convention, in

(a) Adjustment, operation and care of
apparatus;

(b) Transmitting and sound reading at a
speed of words a minute,
Continental Morse, and words
a minute, American Morse;

(c) Use and care of storage battery or
other auxiliary;

(d) Knowledge of international regulations
and Acts of Congress to regulate radio
communication;

(e) Knowledge of United States Naval
Radio Regulations;

and is hereby licensed, as required by law,
Radio Operator, Commercial Extra First
Grade, for two years.

In testimony of trustworthiness and efficient
service as Radio Operator for
months, of which months were
service at sea, and of superior knowledge
and skill, ascertained by special examination
this extra grade licence is granted.

..... Oath of Secrecy executed.
(Examining Officer.)

.....
Secretary of Commerce.

.....
(Title) Notary Public.

.....
Commissioner of Navigation.

Place..... Date..... 19..
This licence is not valid until the following
oath has been executed:—

I,do solemnly
swear that I will faithfully preserve the secrecy
of all messages coming to my knowledge through
my employment under this licence; that this
obligation is taken freely without mental
reservation or purpose of evasion, and that
I will well and faithfully discharge the duties
of the office: So help me God.

.....
(Signature of holder.)

Date of birth,

Place of birth,

Sworn to and subscribed before me this.....

day of..... A.D. 19....

.....
Notary Public.

SEAL.

SERVICE RECORD.

This is to certify that the holder of this
licence has served satisfactorily as radio operator
under my orders during the period named.

Name of Ship or Land Station.	Period	Master, Manager, or Superintendent.
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....

Operators must have the service record on the backs of their licence properly completed and signed by the master of their ship or their employer.

No.

THE UNITED STATES OF AMERICA.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.
LICENCE TO RADIO OPERATOR,
COMMERCIAL* CLASS.
GRADE.

P This is to certify that has been examined and passed pursuant to the Radiotelegraphic Convention, in

(a) Adjustment, operation and care of apparatus;

(b) Transmitting and sound reading at a speed of not less than † words a minute, Continental Morse;

(c) Use and care of storage battery or other auxiliary;

(d) Knowledge of international regulations and Acts of Congress to regulate radio communication;

and is hereby licensed as required by law a Radio Operator, Commercial* grade for two years. The candidate's practical knowledge of adjustment was tested on a set of apparatus. His knowledge of other systems is shown below.

Name of Ship or Land Station.	Period.	Master, Manager or Superintendent.
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....

Operators must have the service record on the backs of their licence properly completed and signed by the master of their ship or their employer.

No.

THE UNITED STATES OF AMERICA.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.
LICENCE TO RADIO OPERATOR,
AMATEUR FIRST GRADE.

Q This is to certify that has been examined and shown to have a knowledge of the adjustment and operation and of the regulations of the Radio telegraphic Convention and the Acts of Con-

* First or Second. † Twenty or Twelve

.....
HERBERT HOOVER,
Secretary of Commerce.

.....Oath of Secrecy executed.
(Examining Officer.)
E. T. CHAMBERLAIN,
Commissioner of Navigation.

.....
(Title.) Notary Public.

Place..... Date..... 19..
This licence is not valid until the following oath has been executed:—

I,.....do solemnly swear that I will faithfully preserve the secrecy of all messages coming to my knowledge through my employment under this licence; that this obligation is taken freely without mental reservation or purpose of evasion, and that I will well and faithfully discharge the duties of the office: So help me God.

.....
(Signature of holder.)

Date of birth,.....
Place of birth,.....
Sworn to and subscribed before me this.....
day of..... A.D. 19....

.....
Notary Public.

SEAL.

SERVICE RECORD.

This is to certify that the holder of this licence has served as radio operator under my orders during the period named.

gress in so far as they relate to interference with radio communication and impose certain duties on all grades of operators sufficient to entitle him to a licence, and he is hereby licensed as required by law Radio Operator, Amateur First Grade for two years.

The candidate was examined and shown to have knowledge (excellent or good) in the following additional subjects:

(a) General adjustment, operation and care of apparatus †.....;
(b) Transmitting and sound reading Continental Morse at a speed of § words a minute

(c) General knowledge of international regulations and Acts of Congress to regulate

†Excellent or good; § Insert speed.

radio communication †.....
Oath of Secrecy executed,
 (Examining Officer.)

 (Title.) Notary Public.

Place....., Date..... 19....
 HERBERT HOOVER,
 Secretary of Commerce.
 E. T. CHAMBERLAIN,
 Commissioner of Navigation.

This licence is not valid until the following
 oath has been executed:—

Ido solemnly
 swear that I will faithfully preserve the secrecy
 of all messages coming to my knowledge through
 my employment under this licence; that this

obligation is taken freely without mental
 reservation or purpose of evasion, and that
 I will well and faithfully discharge the duties
 of the office: So help me God.

(Signature of holder.)

Date of birth.....
 Place of birth.....
 Sworn to and subscribed before me this.....
 day of..... A.D. 19....

Notary Public.

SEAL.

SERVICE RECORD.

This is to certify that the holder of this
 licence has served as radio operator under my
 orders during the period named.

Name of Ship or Land Station.	Period.	Master, Manager or Superintendent.
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....

Operators must have the service record on
 the back of their licence properly completed
 and signed by the master of their ship or their
 employer.

No.
 THE UNITED STATES OF AMERICA.
 DEPARTMENT OF COMMERCE.
 BUREAU OF NAVIGATION.
 RADIO SERVICE.

LICENCE TO RADIO OPERATOR, AMATEUR SECOND GRADE.

R This is to certify that
 has presented satisfactory evidence
 that he has a knowledge of the ad-
 justment and operation of apparatus and of
 the regulations of the Radiotelegraphic
 Convention and the Acts of Congress, in so far
 as they relate to interference with radio com-
 munication and impose certain duties on all
 grades of operators, sufficient to entitle him
 to a licence, and he is hereby temporarily
 licensed as RADIO OPERATOR, AMATEUR SECOND
 GRADE, for the period of eight months or until
 he has been duly examined.

He has shown that he has knowledge
 (excellent or good) of the following additional
 subjects:

(a) General adjustment, operation, and
 care of apparatus.....
 (Excellent or good.)

(b) Transmitting and sound reading
 Continental Morse at a speed of
 words a minute.

(c) General knowledge of international
 regulations and Acts of Congress to regulate
 radio communication.....
 (Excellent or good.)

..... Oath of Secrecy executed
 (Certifying Officer.)

(Title.) Notary Public.

Place....., Date....., 19....
 HERBERT HOOVER,
 Secretary of Commerce.
 E. T. CHAMBERLAIN,
 Commissioner of Navigation.

Ido solemnly
 swear that I will faithfully preserve the secrecy
 of all messages coming to my knowledge through
 my operations under this licence; that this
 obligation is taken freely, without mental
 reservation or purpose of evasion; and that
 I will well and faithfully observe the obligation
 of a licensed radio operator: So help me God.

(Signature of holder.)

Date of birth.....
 Place of birth.....
 Sworn to and subscribed before me this.....
 day of..... A.D. 19..

Notary Public

SEAL.

NOTICE TO BERNE BUREAU.

S The Minister of Marine of the United
 States of America has notified to
 the Berne Bureau that the following
 information is to be published:—

1. The Departments of the United States
 Government which are concerned with wireless
 telegraphy regret that they have not yet been
 able to make arrangements with the land
 telegraph of the United States owing to the
 fact that these are in the hands of commercial
 companies, and have nothing to do with the
 Government. The idea was to arrange for
 the free transmission over the land telegraph,
 in accordance with Article 14, paragraph 2,
 of the Rules of Service of the London Con-
 vention. The information to be transmitted
 free of charge was all such as related to the
 date and the hour of the handing in of radio-
 telegrams on board ship. But the transmission
 of such information over land lines being sub-
 ject to a tax, the Government of the United
 States cannot, at present, conform strictly to
 this rule of the Convention. The declaration
 of the American delegation contained in Article 2
 of the Final Protocol made provision for such
 a possible outcome, although its exact nature
 was not actually set forth.

2. Multiple radiotelegrams, such as are
 mentioned in article 38, paragraph 5, of the

Rules of Service, will be accepted as multiple messages in all wireless transmission between ship and shore stations, but all the companies operating land telegraph lines in the United States will consider, and will charge for, a multiple wireless message as consisting of so many individual telegrams as the addresses it bears may indicate.

3. The United States is not a member of the International Telegraphic Union and consequently is not bound to execute the rules laid down in Article 38, paragraph 8, of the London Convention Rules of Service concerning urgent radiotelegrams. The laws of the United States regulating all reciprocal arrangements between the States forbid the use of the privilege, and consequently all telegraph companies will not allow any priority in favour of telegrams for which any additional tax may have been paid.

T An Act to authorise the President of the United States to arrange and participate in an international conference to consider questions relating to international communication.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be, and he is hereby, requested and authorised in the name of the Government of the United States to call, in his discretion, an international conference to assemble in Washington, and to appoint, by and with the advice and consent of the Senate, representatives to participate therein, to consider all international aspects of communication by telegraph, telephone, cable, wireless telephone, and wireless telegraphy, and to make recommendations with a view to providing the entire world with adequate facilities for international communication on a fair and equitable basis.

SEC. 2.—That the sum of \$75,000, or so much thereof as may be necessary, is hereby appropriated out of any money in the Treasury not otherwise appropriated, the same to be disbursed under the direction and in the discretion of the Secretary of State for expenses incidental to the conference, including personal services in the District of Columbia notwithstanding the provisions of any other Act: *Provided*, That no part of said sum shall be used in entertainment or for the purchase of medals and badges.

Approved, December 17th, 1919.

U.S. RADIO COMPASS STATIONS.

U (See under U.S.A. in Direction Finding Section.)

PUBLIC RESOLUTION.

No. 48—67TH CONGRESS.

[H. J. Res. 7.]

V Joint Resolution to authorise the operation of Government-owned Radio Stations for the use of the general public, and for other purposes.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled: That all land, ship and airship radio stations, and all apparatus therein owned by the United States may be used by it for receiving and transmitting messages relating to Government business, compass reports and the safety of ships.

SEC. 2. That the Secretary of the Navy is hereby authorised, under the terms and conditions and at rates prescribed by him, which rates shall be just and reasonable, and which, upon complaint, shall be subject to review and revision by the Interstate Commerce Commission, to use all radio stations and apparatus, wherever located, owned by the United States and under the control of the Navy Department—(a) for the reception and transmission of press messages offered by any newspaper published in the United States, its Territories or possessions, or published by citizens of the United States, in foreign countries, or by any press association of the United States, and—(b) for the reception and transmission of private commercial messages: *Provided*, That the rates fixed for the reception and transmission of all such messages, other than press messages between the Pacific coast of the United States, Hawaii, Alaska, and the Orient, shall not be less than the rates charged by privately owned and operated stations for like messages and service: *Provided further*, That the right to use such stations for any of the purposes named in this section, except for the reception and transmission of press messages, other than press messages between the Atlantic coast of the United States and ships at sea, shall terminate and cease as between any countries or localities or between any locality and privately operated ships, whenever privately owned and operated stations are capable of meeting the normal communication requirements between such countries or localities or between any locality and privately operated ships, and the Secretary of Commerce shall have notified the Secretary of the Navy thereof, and all rights conferred by this section shall terminate and cease on June 30th, 1925, except that all such rights conferred by this section in the Republic of China shall terminate and cease on January 1st, 1924.

Approved April 14th, 1922.

SEC. 3. That all stations owned and operated by the Government, except as herein otherwise provided, shall be used and operated in accordance with the provision of the Act of Congress entitled "An Act to regulate radio communication," approved August 13th, 1912.

Approved, June 5th, 1920.

URUGUAY

(See Maps 49, 51 and 53.)

LEGISLATION for the Republic of Uruguay is administered by a Parliament of two Houses, the Executive being in the hands of a President elected every four years, and a National Administrative Council composed of nine members.

CONTROL.

Wireless telegraphy in Uruguay is controlled by the Government, the department in charge being the Ministry of War and Marine. The Govern-

ment ship stations are also under the control of the Minister of War and Marine. There are no privately owned stations. There are no radiotelegraphic clubs or societies, in fact wireless telegraphy is entirely a Government monopoly.

ORGANISATION.

The Montevideo station, opened to the public in December, 1911, and standing on a hill three miles from the river, is the only installation doing international work. Its location is called Cerrito de la Victoria, and the wireless station generally goes by the name of "Cerrito." The installations situated at Rivera and Paso de los Toros are employed solely for military purposes, and only in times of crisis, should a breakdown of the ordinary wired service eventuate, are they used for public messages.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Sr. Gilberto Lasnier	Engineer Director	Andes No. 1,230, Montevideo.
Sr. Juan P. Camera	Secretary	Maldonado, No. 1994, ..

The offices of the Dirección de Telegrafía sin Hilos are situate at 25 de Mayo No. 273, Montevideo.

ADMINISTRATION.

The first Decree regulating the subject was issued by the Ministry of War and Marine on September 5th, 1911, and was followed by a Decree dated January, 1912. Under its provisions *all ships calling at the ports of the Republic and destined for passenger service are obliged to be fitted with wireless apparatus.*

We print here the text of both the Decrees above referred to:—

A—Decree of September 5th, 1911 (General Control).

B—Decree of January, 1912 (Compulsory Wireless on Passenger Ships).

C—Decree of August 14th, 1922, replacing the Superior Decree of October 20th, 1914, with the Superior Resolution of November 14th, 1919 (Erection and Operation of Stations).

DECREE OF SEPTEMBER 5TH, 1911.

A 1. The National Wireless Telegraphy Office is under the direct control of the Ministry of War and Marine, with the Engineer Inspector-General at its head.

2. The National Wireless Telegraph Office is in charge of and controls all the radiotelegraphic stations, whether fixed or military movable ones, on vessels or on lighthouses, together with their stuff, apparatus and installations.

3. The Inspector-General will at such times and under such circumstances as he thinks proper make visits of inspection of the stations in order to take personal cognisance of their requirements, and he exercises in regard to the staff, whether military or civil, the character of a staff commander.

4. On the occasion of manœuvres the Inspector-General will designate the country stations which are to take part in accordance with the instructions he receives as to the requirements of the occasion.

5. It is one of the duties of the National Wireless Telegraph Office to propose to the superior department the construction of fresh stations and to report regarding the means for acquiring the same,

6. The Inspector-General controls the sums received for transmission of telegrams, which sums shall be deposited in the Bank of the Republic to the order of the Minister of War and Marine.

7. The National Wireless Telegraph Office will make contracts with the General Post and Telegraph Office and with the shipping companies to be submitted for approval to the Minister of War and Marine; similarly the office is empowered to draw up with the administrations of the neighbouring States radiotelegraphic agreements with the object of improving and amplifying the international wireless telegraph service, all of which shall be submitted for approval by the higher department.

8. The Minister of War and Marine will notify the International Office in Berne of the creation of the National Wireless Telegraph Office in Uruguay, so that in future all questions concerning wireless telegraphy in Uruguay may be referred direct to it.

9. The Inspector-General will report quarterly to the Minister of War and Marine regarding the general conditions and working of the service under his charge, and will compile an annual memorandum upon the general work of his department.

DECREE OF JANUARY, 1912.

B 1. Commencing from May 1st of the present year (1912) all the ships carrying passengers between the harbours of the Republic and those of foreign countries shall be fitted with radiotelegraph installations.

2. The said installations shall be designed to receive and transmit telegrams up to a distance of not less than one hundred kilometres on the ships of river navigation, and four hundred kilometres on those of the oceanic navigation.

3. The installations shall be permanently kept in good conditions of working, and capable of intercommunicating with the stations of the Republic.

4. The stations shall be in charge of persons well acquainted with the use of radiotelegraph apparatus.

5. The service of the stations shall be entirely in accordance with the provisions of the International Radiotelegraph Convention.

6. The agents of the companies will inform, before expiration of the time fixed, the General Inspector of the National Service of Wireless Telegraphy of the characteristics, system, power, etc., of the radiotelegraph apparatus to be fitted on the ships of their companies.

7. The ships which after expiration of the time fixed by Article 1 have not complied with the provisions of this Decree shall not be authorised to carry passengers in the harbours of the Republic.

8. Those ships which do not keep their wireless apparatus in proper working conditions shall be liable to have applied to them the penalty specified in the previous article (7).

9. The General Inspector of the National Service of Wireless Telegraphy is hereby entrusted with seeing that the provisions of this Decree are duly complied with.

DECREE OF AUGUST 14TH, 1922.

C ART. 1.—The Superior Decree of October 20th, 1914, referring to installations of Wireless Telegraphy in this country, as also the modifications made to same contained in the superior resolution of November 14th, 1919, have been cancelled.

ART. 2.—It is allowed to install complete radiotelegraphic and radiotelephonic stations or receiving stations only in the territory of the Republic, except in places where Government stations are installed, nor at a distance of under 50 kilometres from the River Plate or the frontier with Argentina when not in towns of any importance. The radiotelegraph stations merely for study and those of radiotelephonic which cannot be used for telegraphy can also be installed in places where Government stations exist.

ART. 3.—The installation and working of the radiotelegraphic stations authorised by the aforementioned article will be subject to the following conditions:—

(a) In every case when installing a station, if it be in the Department of Montevideo, the person interested must previously communicate in writing to the General Inspection of Wireless Telegraphy the following data:—
Use for which it is destined, class and system of same with specification of power in the antenna and origin of energy with which it will work, class of antenna, height and length of same, place where it will be installed and name of the proprietor, forwarding also a

diagram or plan with a memorandum describing the projected installation. In other departments the aforementioned communication should be made to the respective military authorities or to the Chief of Police, who will have it forwarded to the General Inspection of Wireless Telegraphy and there being no observations to be made the data will be noted in the register, a serial number will be allotted and the wavelength with which it may work will be fixed; installation may then be commenced and when it has once been inspected and tested, communication can be commenced.

In the case of a Receiving Station the person interested will communicate to the corresponding authorities in accordance with the aforementioned giving in such an event only the details which may be requested from him.

(b) They may only be employed for private use or for study, it being absolutely prohibited to carry on a public service or to exploit it in any way.

(c) They will be used exclusively for the communications in the country, and may not have a larger range than 20 kilometres for studying purposes, and all others not over 100 kilometres if there be any Government station in that radius and up to 200 kilometres if no such station exists, and all these must only work with the wavelength approved for them.

(d) The stations which are not for private use or purely for reception may only be worked by persons having a licence as operators at least of the third-class, issued by the General Inspection of Wireless Telegraphy.

(e) To send messages to parts where there are Government stations all transmission must be made to these stations, payment being made at half the tariff rate for messages.

(f) In no case may an installation be erected nearer to a Government station than the following distances:—In Montevideo: Experimental stations 2 kilometres, all others 10 kilometres; in the interior 1 and 5 kilometres respectively.

(g) In addition to the preceding conditions, the stations will be subject to the dispositions and existing or future regulations for telegraphy, wireless or otherwise, and in the event of these regulations not being followed or when the Government so desires, they can be closed by the respective authorities, and the proprietors can have no right to claims or indemnifications whatsoever.

ART. 4.—For the installation and working of radiotelephonic stations which can also communicate radiotelegraphically, the aforementioned conditions will be observed, and for those only radiotelephonic, the following:—

(h) They can be employed for private or business purposes, as also for public use, for study, educational, information, commercial, meteorological, advertising, concerts and, in general, everything in connection with intellectual instruction or of general interest.

(i) When they are employed for the preceding purposes, that is, for commercial or exploitation purposes, the person interested must previously apply in writing to the Ministry of War and Marine for the technical authorisation corresponding to the installation of the station or stations which will be used for the said purposes, and there must be given in the respective application the same information as is required in (a) of Art. 3 of this Decree. The Ministry of War and Marine will pass it to the General Inspection of Wireless Telegraphy who, if they have no technical observations to make, will note down

the characteristics in the respective register, will allot it a serial number and will then forward to the petitioner a certificate of authorisation for the requested installations.

(j) For the exploitation authority which must come after the technical authorisation, those interested must apply to the corresponding Ministry in accordance with existing or future regulations to that effect.

(k) The installation of stations not destined for exploitation purposes as also for those of study or solely receiving stations, will come under the regulations in (a) of Art. 3, with the difference that the wavelength of working will be determined by the respective authorities.

(l) The General Inspection of Wireless Telegraphy will put at the disposal of the Directorate-General of Posts, Telegraphs and Telephones the bands of wavelengths destined for the use of private radiotelephonic stations, and will reserve those corresponding to the Government stations.

(ll) The stations destined for exploitation must be attended by native operators who must hold a first-class professional certificate, issued by the General Inspection of Wireless Telegraphy. These stations may not operate without having been inspected previously by the aforementioned authorities and who may also inspect the working of same if they deem it necessary.

(m) Radiotelephonic communications can be made at any distance within the country, but for the exterior only up to 50 kilometres, with the exception of those made from the Capital of the Republic, and if for ships can be made up to a distance of 100 kilometres, and if for other parts up to 250 kilometres.

When the State possess their own stations, distant communications for the exterior and interior must be made by said stations. In every case the wavelengths authorised by the authorities only will be used, and the Cerrito Station or others that may be available in future will be directed to control them and at the same time to see that the said communications conform to the regulations in force.

(n) In addition to the preceding established conditions the working of the stations will be subject to the existing and future regulations on wireless or other telephones as far as applicable, and in the event of the regulations not being adhered to, the said authorisation can be taken away and the stations closed by the authorities as deemed convenient and the proprietors shall have no claim to indemnification whatsoever.

ART. 5.—Ships carrying the National flag may install radiotelephonic stations, subject to the same regulations as above stations and they must also conform to any international conventions subscribed by this country.

ART. 6.—The General Inspection of Wireless Telegraphy will be in charge of watching and controlling by means of their own stations, the observance of the proper compliance with all the regulations of this Decree, and all operators of wireless telegraphy must comply with and obey any professional direction relating to the service, which may be made by the Government's stations, which shall always have preference in the transmissions of any communications.

ART. 7.—Communicate, etc.

URUGUAY, BOLETIN OFICIAL.

August 14th, 1922.

VENEZUELA

(See Maps 48, 50 and 51.)

THE Republic of Venezuela was formed in 1830 by secession from the other members of the Republic of Colombia. The Constitution in force is that of June 13th, 1914. Legislative authority is vested in a Congress of two Chambers, whilst the Executive power is exercised by a President in conjunction with Cabinet Ministers.

CONTROL AND ORGANISATION.

Radiotelegraphy in Venezuela is controlled by the Government, the Department in charge being the Ministerio of Fomento assisted by the Director of Federal Telegraphs and Telephones.

There are no privately owned Radiotelegraph stations, neither Clubs or Societies.

The Ministerio has granted permission to several Oil Exploration Companies to erect Radiotelephone stations to communicate from the oilfields to the offices, but no such station has yet been erected.

There exist at present eight stations in the different parts of the country for public service.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Antonio Alamo	Minister of Public Works	Caracas.
Gen. F. A. Colmenares Pacheco	Director-General of Federal Telegraphs and Telephones	Caracas.
F. van der Woude	Chief of Radio Communication	Caracas.
Lieut. Antonio Toro Key ..	Director of National Radio School	Caracas.

The plan adopted to erect a radio station in the Capital of each state is still under consideration, as is also the erection of a high power station.

Messages are now accepted to any part of the world and forwarded *via* Radio to Trinidad. The charges of one bolivar and twenty-five centimos being equally divided between the two stations.

There is a National School of Radiotelegraphy to provide the country with native operators for the service. The school is directed by Lieut. Antonia Toro Key.

ADMINISTRATION.

The laws and regulations relating to wireless telegraphy and telephony are contained under the following:—

A—Radiotelegraphic Regulations.

B—Instructions for Radio Telegraphic Stations.

DOCTOR V. MARQUEZ BUSTILLOS,

*Provisional President of the Republic,
in virtue of Clause 10 of Article 79 of the National
Constitution.*

DECREES THE FOLLOWING

A RADIOTELEGRAPHIC REGULATION. HEADING NO. 1.—PRELIMINARY CONDITIONS.

ART. 1.—Wireless telegraphy or radiotelegraphy in Venezuela will be governed by the Law of Telegraphs and Telephones, by the International Radiotelegraphic Convention, by the other special conventions made in respect thereto, by the conditions of the present Decree, and by others that may be prescribed.

ART. 2.—Pre-eminent control and administration of radiotelegraph installations will be in the hands of the Ministry of Public Works; but if the Federal Executive should desire it, they can in war time be placed under the direction of the War Office and Admiralty.

ART. 3.—The National territory is divided into two zones, subject to regulation and jurisdiction. The maritime zone comprises the territorial waters of the Republic, including the navigable rivers. The terrestrial zone embraces all the other installations erected within the Venezuelan territory, including islands, shores and banks.

ART. 4.—With the exception of National or foreign warships, no ship which is anchored may use its radiotelegraph installations, while it is not sailing, unless justified by reason of urgency.

ART. 5.—According to their purpose, radiotelegraph stations are divided as follows:—1st, central station; 2nd, local stations; 3rd, training stations; 4th, portable stations.

ART. 6.—Only the National Government may possess radiotelegraph stations in the terrestrial zone of Venezuela. Private people may be able to use them, subject to the ruling conditions and tariffs.

ART. 7.—All National or foreign merchant vessels carrying more than fifty passengers on an ordinary voyage, whether they put in or anchor at Venezuelan ports, must be in possession of a wireless telegraph installation in perfect condition, and another emergency installation besides, which can work for at least six hours, and be set quickly to work in case of the former apparatus getting out of order in times of danger.

ART. 8.—Ships excepted by the International Conventions and those exclusively devoted to coast navigation through National territorial waters are exempted from carrying wireless installations.

Ships which are exempted from the said

obligation may not possess radio installations without previous permission from the Federal Executive.

GENERAL CONDITIONS.

FIRST SECTION.

Signals and Radiotelegraphic Waves.

ART. 9.—The exchange of signals, superfluous words, experimenting or practising that may in any way interrupt radiotelegraphic correspondence is forbidden at ordinary stations.

ART. 10.—The normal length of a wave will be 600 metres. Training and portable stations shall use a smaller one, to be fixed for them, so as not to interfere with ordinary communications.

ART. 11.—Permission is given in exceptional circumstances for other wavelengths to be used in accordance with the terms of the International Regulations.

ART. 12.—The signs used for radiotelegraphic communications will be those of the International Morse alphabet.

ART. 13.—Ships in distress will use the sign adopted by the International Conventions.

ART. 14.—As soon as a station hears danger calls, it shall suspend all correspondence and not resume it until after having made certain that the communication of danger has been concluded; it shall attend to the calls wherever there origin may be, and answer them; it shall in conformity with the notifications from the ship communicate with the authorities of the respective littoral.

ART. 15.—In radio communications between coast and ship stations the call, pauses and inquiries noted in the Regulation annexed to Radiotelegraphic Convention, signed in London on the 5th July, 1912, shall be observed; this will not prevent the use of others for interior service, but in this case the use of any universally adopted signals that might cause confusion is strictly forbidden.

SECOND SECTION.

(1) *Personnel of the Radiotelegraph Service.*

ART. 16.—The Director-General of Telegraphs and Federal Telephones will be the head of the radiotelegraph stations in everything concerning the service. Anything relating to the inspection and working of the installations, complaints, fulfilment of regulations and application of penalties is included in his duties which he shall exercise direct, giving account of each case to the Ministry of Public Works.

ART. 17.—For the supervision of installations, the Ministry of Public Works may appoint inspectors of radiotelegraphy, with jurisdiction over a particular littoral.

ART. 18.—The radiotelegraphic service of each installation shall be performed by an operator who holds a first-class efficiency certificate. The latter includes :—

- (a) A knowledge of the apparatus and of their arrangement and working ;
- (b) A capacity for transmitting and receiving audibly at a minimum speed of twenty words a minute ;
- (c) A knowledge of the International Regulations, local laws and regulations compulsorily applicable to the service and exchange of radiotelegraph communications.

ART. 19.—In exceptional cases, when the service has to be entrusted to an operator who has only a second-class certificate, the latter must guarantee the same efficiency as a first class, except in regard to speed transmission and reception capacity, which must never be less than twelve words a minute.

ART. 20.—The duties of bookkeeping and filing at radiotelegraph stations are under the charge of the operator and the Exchequer of Federal Telegraphs and Telephones.

ART. 21.—Radiotelegraph stations, according to their importance and local regulations, shall be worked by a requisite subordinate staff in accordance with the dispositions of the Ministry of Public Works, for dealing effectively with the service.

ART. 22.—Radiotelegraph stations shall be connected with the National Telegraph system.

Radiograms may be handed in at ordinary telegraph offices for transmission by the stations. In these cases the receiving clerk must make separate bookkeeping entries.

(b) School of Radiotelegraphy.

ART. 23.—The School of Radiotelegraphy is an institution for educating the technical staff of the Republican radiotelegraph and radiotelephone stations.

ART. 24.—The Director-General of Telegraphs and Federal Telephones, the Head Professor and a language professor will constitute the personnel of the school.

ART. 25.—The Director-General of Federal Telegraphs and Telephones shall exercise control over the school and see that it is well conducted, notifying the Ministry of Public Works every time amendments are necessary or suitable improvements might be adopted.

ART. 26.—The Head Professor, who is immediately subordinate to the Federal Director-General of Telegraphs and Telephones, shall deal with the organisation and working of the institution, and shall besides give instruction on the subjects necessary for the course of training and in accordance with the programme of studies which he shall elaborate and submit for approval to the Ministry of Public Works.

ART. 27.—The Language Professor shall give pupils the special instruction desired and do his best besides to assist in the good management of the school.

ART. 28.—To be admitted as a pupil in the school the following is necessary :—

- (a) To be over eighteen and under thirty-five years of age ;
- (b) A holder of a high grade certificate of instruction ;
- (c) To be known to be of good conduct ;
- (d) A holder of a certificate from the National Health Office certifying good health ;
- (e) Written permission from a legal representative in the case of minors.

- (f) To request registration in a legal form within the prescribed time before the opening of a term. The request shall be addressed to the Minister of Public Works and shall be accompanied by the confirmation that the other requisites herein mentioned are complete.

ART. 29.—The number of pupils that will form a radiotelegraphic course shall in every case be fixed by the Ministry of Public Works.

ART. 30.—Nobody can be appointed to take an operator's position in the Republican Radiotelegraph or Radiotelephone Service who has not obtained a diploma for efficiency.

ART. 31.—In order to obtain the diploma referred to in the previous Article it is necessary to have gone through a course at the School of Radiotelegraphy in the subjects contained in the schedule of studies and to have passed the requisite examination satisfactorily, which shall consist of three divisions :—

(i) A half an hour's oral test on subjects taken by ballot from the programme which shall be done by numbering slips from one upwards to the number of subjects contained in the programme.

(ii) To draw up in fifteen minutes a document of the service proposed by the Examining Board.

(iii) Transmitting and receiving practice for fifteen minutes. In no case will a candidate be approved who has not executed a speed minimum of twelve words a minute.

ART. 32.—The optional examinations for the diploma are always individual ones, and can be arranged at any time on the date fixed by the Ministry of Public Works, in accordance with the request which the candidate must make in legal form, which must bear at the foot thereof the certificate issued by the Director of the School, stating that the candidate has attended the course regularly, been punctual for the classes and done the tasks required in accordance with the schedule of studies.

ART. 33.—If the candidate should be approved, besides the diploma a certificate will be sent him, a first-class one if the transmitting and receiving speed is a minimum of twenty words a minute, and a second-class one if the speed varies between twelve and nineteen words a minute.

ART. 34.—The examining boards for the diploma shall consist of five members : the Director-General of Federal Telegraphs and Telephones, the Head Professor of the School of Radiotelegraphy and three technical specialists, preferably chosen from first-class operators.

THIRD SECTION.

RADIOTELEGRAPHIC SERVICE, OFFICIAL AND PRIVATE.

I.—Order and Preference.

ART. 35.—The radiotelegraph service is intended chiefly for commerce and private people. Only when it is a question of messages sent by the President of the Republic or by the Commander-in-Chief of the National Army, in case of interruption of the ordinary lines or on matters of distinct urgency may the wireless telegraph of the terrestrial zone be used for official communications.

ART. 36.—Radiograms shall be despatched in the following order :—

- (a) Official service, and this will be according to the rank of the sending official.
- (b) Private radiograms in the order in which they are handed in.

ART. 37.—Radiograms referred to in Article 13 shall have absolute priority.

II.—Free Traffic.

ART. 38.—Radiograms will be free that are sent on service matters by officials authorised by the Law on Telegraphs and Telephones of the 20th June, 1918.

ART. 39.—Free traffic is not exempt from the supplementary taxes of ships and other foreign stations that have to handle the communications.

ART. 40.—The right to send a reply free of charge is proved by the presentation of the official radiotelegram or telegram requiring it.

III.—Tariff.

ART. 41.—The radiotelegraphic charge will be:—

I.—For Interior Service.

- (a) Radiotelegraphic charge, properly so-called at the rate of B. 0.25 a word with a minimum of ten words for every radiogram.
- (b) Telegraphic or postal charge, or both, according to the means of communication to be employed, whenever there is no radiotelegraphic station at the place of origin or destination, and whenever the sender may request these special services.

II.—For Exterior Service.

- (a) Radiotelegraphic charge properly so-called at the rate of B. 0.60 per word, with a minimum of ten words for every radiogram.
- (b) Coast or ship tax of the station or ship to which the radiogram is sent according to the special tariff for same.
- (c) Telegraphic or postal charge, or both, according to the means of communication that may have to be employed, whenever there is no radiotelegraphic station at the place of origin or destination, and whenever the sender may request these special services.

Sole paragraph. In the radiotelegraphic charge properly so-called the address and signature will be collected both for interior and exterior service.

IV.—Secrecy.

ART. 42.—All legal dispositions relating to keeping correspondence secret shall be applied to radiotelegrams.

ART. 43.—Only the President of the Republic, the Commander-in-Chief of the National Army, the Ministers of the Interior, the Governor of the Federal District and National Diplomatic Ministers or foreign residential ones may send or receive messages in code without any restriction.

ART. 44.—Subordinate employees will also be allowed to send cypher radiograms when dealing with a reply so required by their superiors mentioned in the foregoing Article.

ART. 45.—In International communications private people may for the purposes of economy use ordinary well-known telegraphic codes; but in every case the translation of the message must be attached so that it can be filed with the original radiogram.

HEADING NO. III.

SPECIAL CONDITIONS.

FIRST SECTION.—PENALTIES.

ART. 46.—Breaches of the present Regulations will be punished by fines from 100 to 20,000 bolívares, which will be applied by the Director of Federal Telegraphs and Telephones, or imprisonment in proportion. In the event of their being guaranteed these fines will be subject to appeal before the Ministry of Public Works.

ART. 47.—The possession or use of clandestine radio electrical installations will be punishable by fine up to 20,000 bolívares and also by Government confiscation of apparatus and instruments; without prejudice to a prosecution that might be taken up, when besides infringing these conditions the fact constitutes an offence against the security of the State or the Constitutional Powers.

SECOND SECTION.—INSTRUCTIONS.

ART. 48.—By separate resolutions the Ministry of Public Works will draw up the instructions to be observed in the radiotelegraphic service; it will fix the places where the stations shall be installed; it will grant the permits referred to in Article 8; it will organise the instruction and examination of operators; it will fix bases for bookkeeping, and will prescribe all rules of a technical character that have to be observed in the service.

Given, signed, sealed with the seal of the Federal Executive and countersigned by the Minister of Public Works, at the Federal Palace, Caracas, on the thirty-first day of the month of January, 1921. The 111th year of Independence and the 62nd of the Federation.

(Place for the Seal.)

V. MARQUEZ BUSTILLOS.

Countersigned.

Seal.

G. TORRES,

The Minister of Public Works.

INSTRUCTIONS FOR RADIOTELEGRAPHIC STATIONS.

United States of Venezuela—Ministry of Public Works—Direction General of Statistics and Communications.
CARACAS, 31st January, 1921.
111th and 62nd Year.

It is Resolved:

By Order of the Provisional President of the Republic and in conformity with Article 48 of the Radiotelegraphic Regulations for the following to be binding.

PRELIMINARY REMARKS.

The present instructions contain the rules which must be observed by the Venezuelan stations in the execution of the Radiotelegraphic Service.

These rules refer principally;

- (1) To the tariff.
- (2) To the transmission of radiotelegrams.
- (3) To the admission and classification of messages.
- (4) To the signals adopted.

Besides the present instructions, the object of which is to facilitate the regularity of the service, the Venezuelan radiotelegraphic stations will be subject to the Law of Telegraphs and Telephones, to the International Telegraphic Convention and the International Radiotelegraphic Convention, as well as the regulations annexed to these. The said date will furnish the basis for the execution of the service in the International régime.

The stations will be also subject to the telegraphic tariff used in Venezuela and to those besides which link up the service with the exterior so as to make up the total rate of each message. Likewise they will be subject to the nomenclature of the radiotelegraphic stations, and finally to all the legal conditions and Venezuelan regulations referring to the radiotelegraphic service.

NO. I.—RADIOTELEGRAPHIC STATIONS.

A. Radiotelegraphic stations are shown in the "nomenclature of radiotelegraphic stations."

This nomenclature gives the following particulars in regard to every station :—

(1) For coast stations, the name, nationality, and geographical position indicated by the territorial division, and by the longitude and latitude of the place; for ship stations, the name, and nationality of the ship, and in certain cases the name and address of the owner.

(2) The call signal. (The signals are different from one another, and each one is formed by a group of three letters.)

(3) Normal range.

(4) The radiotelegraphic system of transmission (musical spark, tonality expressed by the number of duplicate vibrations, etc.)

(5) Length of waves used. (The length of the normal wave is underlined.)

(6) The nature of the services effected.

(7) The hours of opening.

(8) If the case should arise the hour and method of sending hourly signals and meteorological reports.

(9) The coast and ship tariff.

B. The name of the ship station as shown in the first column of the nomenclature is followed in case of ambiguity by the call signal of the station.

C. The following abbreviations are used in service documents :—

P.G.—Station opened for public correspondence in general.

P.R.—Station opened for restricted public correspondence.

P.—Station opened for private interests.

O.—Station opened only for official correspondence.

N.—Station for permanent service.

X.—Station with no fixed intermission.

D. At coast stations the service will be as far as possible permanent by day and night without interruption. Nevertheless, some stations can carry on a service of limited duration.

Coast stations where the service is not permanent may not suspend their work until having transmitted all their radiotelegrams to the ships which are in the sphere of action, nor until after having received from these ships all the radio telegrams advised. This condition is likewise applicable when ships signal their presence before the suspension of work has been effected.

E. Ship stations are divided into three categories :—

(1) Stations for permanent service.

(2) Stations for limited service.

(3) Stations with no fixed intermission.

During navigation the following must remain in expectation of reception :—

(1) Stations under the first category.

(2) Those under the second category during service hours, and outside of those hours during the first ten minutes of each hour.

Stations of the third category are not bound by any regular waiting service.

The radiotelegraphic service of the ship station is under the supreme authority of the commander or captain of the ship.

F. Fixed stations of the terrestrial zone are divided according to their purpose into four categories, namely :—

(1) Central station.

(2) Local stations.

(3) Training stations.

(4) Portable stations.

G. The central station as regard service is bound by obligations of the coast stations.

Local internal stations, which, on account of their position, are outside of communication with ships, will be worked like ordinary national telegraph offices.

Training and portable stations will be governed by the special provisions concerning them which will be prescribed in each case by separate resolutions.

H. All fixed radiotelegraphic stations will be linked with the telegraphic system of Venezuela. By the latter, radiotelegrams can be sent and received.

NO. 2.—RADIOTELEGRAPHIC CORRESPONDENCE.

A. Every person has the right to make use of International radiotelegraphic communication.

The sender of a private telegram is obliged to prove his identity when asked by the office or station of origin.

The right to correspond radiotelegraphically is subject, nevertheless, to the fulfilment of the local regulations and tariffs.

B. The Government does not accept any responsibility by reason of the radiotelegraphic service supplied to private people.

C. The text of the telegram must be written legibly in characters which have their equivalent on the telegraphic signals used in Venezuela. These characters are as follows :—

LETTERS.

A B C D E F G H I J K L M N O P Q R S
T U V W X Y Z.

á ñ ö ü.

FIGURES.

1 2 3 4 5 6 7 8 9 0.

SIGNS OF PUNCTUATION.

Full stop (.) ; comma (,) ; semi-colon (;) ; colon (:) ; note of interrogation (?) ; exclamation mark (!) ; apostrophe (') ; hyphen (-) ; parenthesis () ; inverted commas (" ") ; oblique (/) ; underline (_).

D. The various parts of which a telegram is composed should be written in the following order :—

(1) Supplementary instructions.

(2) The address.

(3) The text.

(4) The signature.

E. The sender must write on the form immediately before the address the supplementary instructions.

Multiple radiotelegrams will have this remark written immediately before the addresses concerned.

The remark "Urgent" is not admitted in Venezuela except on the ordinary telegraphic system.

F. Every address must contain at least two words. The first giving the name of the addressee, the second indicating the station of destination. Nevertheless, if the address is lacking in further necessary particulars for the addressee to be traced without difficulty by the office of destination the sender shall abide by the consequences of insufficient address.

G. The address of radiotelegrams destined for ships must be as full as possible. They must necessarily contain :—

(a) Name or capacity of the addressee with supplementary particulars if need be.

(b) Name of the boat as shown in the first column of the nomenclature.

(c) Name of the coast stations as shown in the nomenclature.

Nevertheless, the name of the ship may be substituted at the sender's risk by the route indication and determined by the name of the ports of origin and destination or by some other similar remark.

H. Telegrams without text are admitted.

The text may be written in plain language or in secret language, and in the latter case it may be in code language or in cypher language. Each one of these languages may be used singly or in combination with others in the same telegram.

It can also be written by means of the International Code of signals. The radiotelegraphic station will not translate this text when the telegram has to be retransmitted to another station.

I. The station of origin in Venezuela does not admit messages in secret language except on condition that they fulfil the requirements established in Article 45 of the radiotelegraphic Regulations. This provision is not applicable to transit telegrams.

J. Plain language is understood to be that which suggests an intelligible meaning in one or more of the languages authorised for international telegraphic correspondence.

The use of code addresses, commercial signs, international code signals, abbreviations, initials such as f.o.b., c.i.f., or analogous terms do not deprive the telegram of its plain language character.

K. Code language is composed of words that do not form intelligible sentences.

Words actual or artificial must be pronounceable in Spanish, German, French, Dutch, English, Italian, Portuguese or Latin.

Artificial words must not bear accented letters.

Code language must not have more than ten characters of the Morse alphabet. The ch or any other combination of vowels or double consonants will be counted as two letters in artificial words.

Words formed by the combination of two or more in plain language against the usage of the language are not admitted.

L. Cypher language is that formed by—

(1) Either Arabic cyphers, groups or series of Arabic numbers with a secret meaning, or by letters (unaccented), groups or series of letters with a secret meaning.

(2) Words, names, expressions or combinations of letters which do not fulfil the conditions of plain language nor of code language.

The mixture of cyphers and letters with a secret meaning is not admitted in the same group.

The groups referred to under paragraph J are not considered to be of secret meaning.

M. The signature is not obligatory; it may be written by the sender in accordance with custom or substituted by a registered address.

It is indispensable for every message to be signed in Venezuela, although the signature need not be transmitted, at any rate the registered address used as the signature must be translated at the foot of the telegram.

NO. 3.—OFFICIAL RADIOTELEGRAMS.

A. An official message is understood to be that dealing with matters of public service

and sent by a Government official in the exercise of his duties.

B. Official radiotelegrams must bear the seal of or a memorandum from the sending official unless there is no doubt of their authenticity.

C. The right to send a reply as an official radiotelegram is proved by the production of the message requiring it.

D. Official radiotelegrams can in any case be written in secret language.

E. The receiving station must repeat official messages; partially if they are written in plain language, and wholly if in secret language.

NO. 4.—SERVICE RADIOTELEGRAMS.

A. Only authorised employees can send service radiotelegrams free. This privilege is limited to radios that present an urgent character and they must be written in a concise form. Exclusive of such cases the station may refuse the message or forward a duplicate by post.

B. Service advices may also be exchanged free of tariff between two or more stations respecting repetitions, rectifications, or cancellation of messages or anything affecting the correct transmission.

C. When the service advice is requested by a private person it will be charged according to the tariff. In communications with boats the advice may only refer to the rectification of radios previously transmitted. The letters S.T. must precede the preamble of these radiotelegrams. If there should be need to rectify a word it will be indicated by the position it occupies in the text of the message, independent of the rules of taxation.

NO. 5.—METHOD OF COUNTING WORDS.

A. All that which the sender writes on the form for transmission is subject to taxation, and is included in the number of words. Hyphens which separate words and signs of punctuation are only transmitted by special request or when they form groups of signs in secret language, and in these cases they are subject to tariff.

B. The name of the station, number of the radiotelegram, time of handing in and other indications in the preamble are not counted or charged unless the sender inserts any of these remarks in the text of his radiotelegram, and then they form part of the number of chargeable words.

C. One word is counted for the following, in all languages:—

(1) In the address.

(a) The name of the office of destination (or the coast station) written as shown in the first column of the nomenclature with the relative indications.

(b) The names of the territorial subdivisions respectively written in accordance with the nomenclature.

(2) The name of the ship as shown in the first column of the nomenclature.

(3) The code words fulfilling the conditions under paragraph K of No. 2.

(4) Every isolated character, letter or cypher, as well as every sign of punctuation apostrophe or hyphen transmitted at the sender's request.

(5) The underline.

(6) The parenthesis signs.

(7) The inverted commas.

(8) The supplementary instructions.

D. In plain language any word or authorised group containing fifteen letters of the Morse alphabet is reckoned as a single word. Any characters in excess, should there be any, are calculated as an additional word.

In code language every ten characters are counted as one word.

In cypher language every five letters or numbers are counted as one word.

E. If in the same message there should be complete sentences in plain language and in code language or cypher language the words in each sentence will be counted according to the former rule; but if there should be code or cypher words intercepted in the plain language the whole radiotelegram will be considered as cypher, and if without cyphers as code language.

F. Words joined by hyphens and apostrophes will be counted as separated and the syllabic sounds by the number of letters of which they are composed.

G. The combination of words against general usage is not admitted. Usage is justified if the point should arise by reference to a dictionary of the respective language.

H. The counting of words at the station of origin is decisive, but if the office of destination should discover an error it may claim the excess from the addressee, and if the latter should refuse to pay it have a service advice sent for the amount to be collected from the sender. When the latter has paid the difference another service advice will be sent authorising delivery of the message.

No. 6.—TARIFFS AND TAXATION.

A. Radiotelegrams originating from a ship are taxed as addressed to the nearest coast station. In the charge the supplementary telegraphic tariff will be included.

B. When the sender gives instructions on his message for the retransmission of the radiotelegram to another station he shall pay the tariff relative to each service. This rule will be applied when the retransmission of a radio sent by land is effected through two or more ship stations.

C. The total rate for telegrams will be collected from the sender except:—

- (1) Express charges.
- (2) Portage charges by the station of destination.
- (3) In cases provided for under letter G of this paragraph.

D. The rate will be collected in bolivares, and foreign tariffs will in each case be converted to this currency.

E. Rates will be fixed in accordance with the particulars in the nomenclature.

F. Ship stations may obtain information from coast stations when they are not in possession of all the necessary particulars for making up the rate of the telegrams.

G. When the transit tax is not shown in the nomenclature the office of origin will include in the preamble the remark "tax to be collected." The same thing will be done when it is from a sender in a country not adherent to the International Conventions.

H. The sender of the radiotelegram has the right to ask for a receipt with a note of the amount collected. The office of origin may charge a fee for this of 25 cents.

No. 7.—TRANSMISSION OF RADIOTELEGRAMS.

A. The length of a normal wave is 600 metres. Every station must be equipped so as to be able to send waves of 300 metres as well. But it must always be in condition to receive calls made by means of the normal wavelength.

B. Stations intended exclusively for determining the position of ships must not use wavelengths exceeding 150 metres.

C. The foregoing conditions, indispensable to a good public service shall not prevent, if the case should arise, for the Government to make any variations which it may judge convenient for its radiotelegraphic correspondence.

D. Stations must maintain traffic with the least waste of power. Ship stations must not use more than 1 kW. unless the boat is obliged to communicate at a distance exceeding 200 nautical miles, or when exceptional circumstances require an increase in power.

E. The exchange of signals, superfluous words, experimenting or practice, that may disturb the service of other stations is forbidden. For this reason training and portable stations will use wavelengths different to the normal.

F. Should the foregoing rules be infringed the station must lodge a complaint in detail to the Director-General of Federal Telegraphs and Telephones.

No. 8.—TRANSMITTING SIGNALS.

The routine specified is in accordance with Chapter VI. of the Service Regulations attached to the International Radiotelegraphic Convention and is therefore omitted.

No. 9.—FORWARDING TO DESTINATION.

A. The sender may order a radio to be sent by telephone. If so, the word "Telephone" shall be written before the address.

B. For despatch to destination radiograms are classified in the same order of priority as for transmission.

C. Radios with the remark "Day" are not delivered during the night; those received during the night are not immediately delivered unless they contain the word "Night," or the receiving station should consider them to be of a real urgent character.

D. The radiogram may be delivered in the absence of the addressee to the members of his family, and to persons in his employ. The remark "M.P." or "manos propias," i.e. (own hands), as well as the remark "Open," are only admitted in official correspondence.

E. When the radiograms cannot be delivered the station of destination shall explain the reason by service advice. If need be, a mistake in the address will be corrected.

F. Radiograms not transmitted shall be sent by post to the Director-General of Federal Telegraphs and Telephones to be filed.

G. When a radiogram has to be transmitted to a boat and the latter is not yet within range of the station, it will be treated like a message not transmitted, the sender being advised on the eighth day unless the latter should order another waiting period of nine days. If the station is sure that the ship has sailed beyond its range it may cancel the message and advise the sender.

Let it be communicated and published.

By the Federal Executive,

G. TORRES.

WEIHAIWEI

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. W. Russell Brown ..	Officer Administering the Government.	Government House, Port Edward Weihaiwei.
Mr. S. Wyatt-Smith ..	Senior District Officer ..	Government Offices, Weihaiwei.

ADMINISTRATION.

Wireless Telegraphy in the territory is governed by :

A—Ordinance No. 5 of 1913.

AN ORDINANCE TO PROVIDE FOR THE
REGULATION OF WIRELESS
TELEGRAPHY.

A

L.S. August 11th, 1913.
BE IT ENACTED by the Commissioner of Weihaiwei as follows :—

1. The Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. "Telegraph" means an electric, galvanic or magnetic telegraph, and includes appliances and apparatus for transmitting or making telegraphic, telephonic or other communications by means of electricity, galvanism, or magnetism.

The expression "Wireless Telegraphy" means any system of communication by "telegraph" (as defined in this Ordinance) without the aid of any wire connecting the points from and at which the messages or other communications are sent and received; provided that nothing in this Ordinance shall prevent any person from making or using an electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Commissioner may whenever he shall deem it expedient to do so licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the territory or on board any British ship registered in the territory.

4. (i) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the territory or on board any British ship registered in the territory except under and in accordance with a licence granted in that behalf by the Commissioner.

(ii) Every such licence shall be in such form and for such period as the Commissioner may determine and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as the Commissioner shall consider desirable in the public interest.

5. (i) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Commissioner.

(ii) If a magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Commissioner may make regulations for all or any of the following matters :—

(i) For prescribing the form and manner in which applications for licences under this Ordinance are to be made;

(ii) For prescribing the fees payable on the grant of any licence;

(iii) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship whether British or foreign in the waters of the territory shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the territory or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) For prohibiting except with the special or general permission of the Commissioner the working or using of any apparatus for wireless telegraphy on board a merchant ship whether British or foreign whilst such ship is in any of the harbours of the territory;

(v) For prohibiting or regulating in case at any time in the opinion of the Commissioner an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board British ships whether British or foreign in the waters of the territory the use of wireless telegraphy on board such ships while in such waters by such further rules as the Commissioner may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraphs (iii), (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the Commissioner that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy a licence for that purpose shall be granted subject to such special terms, conditions and restrictions as the Commissioner may think proper, but shall not be subject to any rent or royalty.

8. (i) Every omission or neglect to comply with and every act done or attempted to be

done contrary to the provisions of this Ordinance or of any regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine of five hundred dollars.

(ii) All convictions, forfeitures and fines under this Ordinance or any regulations made thereunder may be had and recovered before a magistrate.

9. Ordinance No. 1 of 1904 to regulate the establishment of wireless electric telegraphy is hereby repealed.

ZANZIBAR

(See Maps 25, 28 and 33.)

Including : Pemba.

THE Zanzibar Protectorate includes the islands of Zanzibar and Pemba. The Protectorate Council comprises the Sultan, the British Resident and seven members.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. R. Withycombe, M.B.E.	Director of Electricity, Railways, and Wireless Telegraphy	Zanzibar
Mr. S. W. Dyer	Assistant do. do.	Zanzibar

ORGANISATION.

The Government maintains wireless stations in Zanzibar and Pemba.

ADMINISTRATION.

We append herewith the Decree issued by the Sultan in 1909 and revised in 1922 in regard to wireless.

THE WIRELESS TELEGRAPHY DECREE (No. 6 of 1909, revised 1922).

A DECREE TO REGULATE THE USE OF WIRELESS TELEGRAPHY IN ZANZIBAR.

[February 9th, 1909.]

1. This Decree may be cited as "The Wireless Telegraphy Decree."

2. The term "ship" includes steamers, sailing-ships, dhows, lighters, rafts, and every other form of boat.

The expression "wireless telegraphy" means any system of communication by telegraph as defined in "The Indian Telegraph Act, 1883," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

Provided that nothing in this Decree shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) No person shall establish any wireless telegraph station or install any apparatus for wireless telegraphy in any place in our dominions except under and in accordance with a licence granted in that behalf by the British Resident.

(2) Every such licence shall be in such form and for such period as the British Resident may

determine, and shall contain the terms, conditions, and restrictions on and subject to which licence is granted, and any such licence may include two or more stations or places.

(3) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be guilty of an offence against this Decree, and on conviction he shall be liable to a fine not exceeding 1,500 rupees, or to simple imprisonment for a term not exceeding twelve months, or to both, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Decree except by the order of the British Resident.

(4) If the Court is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within its jurisdiction without a licence in that behalf, it may grant a warrant to any officer of our police to enter and inspect the station or place or ship, and to seize any apparatus which appears to him to be used,

or intended to be used, for wireless telegraphy therein.

(5) The British Resident may make regulations for prescribing the form and manner in which applications for licences under this Decree are to be made and fees payable on the grant of any such licence.

4. Where the applicant for a licence proves to the satisfaction of the British Resident that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted, subject to such special terms, conditions, and restrictions as the British Resident

may think proper, but shall not be subject to any rent or royalty.

5. No person shall work any apparatus for wireless telegraphy installed on any ship whilst that ship is in the waters of our dominions otherwise than in accordance with Regulations made in that behalf by the British Resident who may by any such Regulations impose penalties for the breach of any such Regulations not exceeding 150 rupees for each offence, and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ship. Save as aforesaid, nothing in this Decree shall apply to the working of apparatus for wireless telegraphy installed on any foreign ship.

GREAT BRITAIN.

NEW BILL AMENDING WIRELESS LAW.

The text of the new Bill for amending the Wireless Telegraphy Act of 1904 was received after the Laws and Regulations for Great Britain had been printed. This Bill will be considered by Parliament and may be considerably amended before being passed into law. We print below the text as originally presented by the Postmaster-General:—

A BILL

TO RE-ENACT AND AMEND THE LAW RELATING TO WIRELESS TELEGRAPHY AND TO MAKE PROVISION WITH RESPECT TO VISUAL AND SOUND SIGNALLING AND THE USE OF ETHERIC WAVES FOR THE TRANSMISSION OF ENERGY.

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. (1) A person shall not establish or maintain any wireless telegraph station, or install, work, or maintain any apparatus for wireless telegraphy in any place or on board any ship or aircraft to which this Act applies except under and in accordance with a licence granted in that behalf by the Postmaster-General.

(2) Every such licence shall be in such form and for such period and shall be granted on and subject to such terms, conditions, and restrictions as the Postmaster-General may determine, and any such licence may include two or more stations, places, ships, or aircraft.

(3) If any person establishes or maintains a wireless telegraph station without a licence in that behalf, or installs, works, or maintains any apparatus for wireless telegraphy without a licence in that behalf, he shall be guilty of a misdemeanour, and be liable—

(a) on conviction on indictment, to imprisonment with or without hard labour, for a term not exceeding twelve months, or to a fine not exceeding one hundred pounds;

(b) on summary conviction, to imprisonment, with or without hard labour, for a term not exceeding three months, or to a fine not exceeding fifty pounds, and, in the case of a continuing offence, to a further fine not exceeding five pounds for each day during which the offence continues;

and in either case be liable to forfeit any apparatus for wireless telegraphy installed, worked, or maintained without a licence, but no proceedings shall be taken against any person under this Act except by order of the Postmaster-General; the Admiralty, the Army Council, the Air Council, or the Board of Trade,

(4) If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established, or is being maintained, without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed, or is being worked or maintained in any place or on board any ship or aircraft within his jurisdiction without a licence in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Postmaster-General, the Admiralty, the Army Council, the Air Council, or the Board of Trade and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place, ship or aircraft and to seize any apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) The expression "wireless telegraphy" means any system of communication by telegraph as defined in the Telegraph Acts, 1863 to 1924, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

2. (1) Where the applicant for a licence proves to the satisfaction of the Postmaster-General that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted, subject to such special terms, conditions, and restrictions as the Postmaster-General may think proper, but shall not be subject to any rent or royalty.

(2) Where an applicant for a licence satisfies the Postmaster-General that a wireless telegraph station is to be used solely for the sending or receiving of telegrams which are within the first or second exception from the exclusive privilege conferred upon the Postmaster-General by the Telegraph Act, 1869, a licence for that purpose, if granted, shall not be subject to any rent or royalty.

(3) The provisions of this section and of the enactment replaced thereby, providing that a licence is not to be subject to any rent or royalty, shall not prevent, and shall be deemed never to have prevented, fees (periodical or otherwise)

prescribed for the purpose being charged in respect of the grant or renewal thereof.

3. (1) The Postmaster-General may make regulations—

(a) as to the terms, conditions, and restrictions on or subject to which licences or any class of licences under this Act are to be granted, renewed, suspended, or withdrawn; and

(b) requiring any operators or other persons engaged in the working of wireless telegraphy to be provided with certificates, and making provision as to the manner and conditions of the issue and renewal of any such certificate, including the examinations and tests to be undergone, and the form, custody, production, cancellation, suspension, endorsement and surrender of any such certificate, whether issued before or after the passing of this Act; and

(c) as to the extent to which this Act is to apply to British ships and aircraft registered elsewhere than in Great Britain, Northern Ireland, the Channel Islands or the Isle of Man, and to foreign ships and aircraft, and as to the working of any apparatus for wireless telegraphy installed therein;

(d) for giving effect to, and securing compliance with, the provisions of any international convention signed on behalf of His Majesty, and any regulations made thereunder, so far as the same relate to wireless telegraphy;

(e) prescribing, subject to the consent of the Treasury, the fees to be paid periodically or otherwise in respect of the grant or renewal of any licence or certificate.

(2) Regulations under this section may provide that any person acting in contravention of or failing to comply with the regulations or any of them, or the terms, conditions and restrictions, or any of them, on or subject to which any such licence or certificate as aforesaid has been granted, shall, on summary conviction, be liable to imprisonment for a term not exceeding three months, or to a fine not exceeding fifty pounds, and, in the case of a continuing offence, a further fine not exceeding five pounds for each day during which the offence continues, and be liable to forfeit any apparatus for wireless telegraphy in respect of which the offence is committed.

(3) Every regulation made under this section shall be laid before both Houses of Parliament as soon as may be after it is made, and, if an address is presented by either House within twenty-one days on which that House has sat next after any such regulation is laid before it, praying that the regulation may be annulled, His Majesty in Council may annul the regulation, but without prejudice to the validity of anything previously done thereunder.

4. (1) A person shall not—

(a) send or attempt to send by wireless telegraphy a message or communication of an indecent, obscene, or offensive character, or a message or communication subversive of public order; or

(b) send or attempt to send by wireless telegraphy a signal of distress of a false or misleading character, or a false or misleading message as to a vessel in distress; or

(c) improperly divulge the purport of any message sent or proposed to be sent by wireless telegraphy.

(2) If any person acts in contravention of this section he shall be liable on summary conviction to a fine not exceeding ten pounds, or on conviction on indictment to imprisonment, with or without hard labour, for a term not exceeding twelve months.

5. (1) The Postmaster-General may, in his discretion, mitigate any penalty incurred or alleged to be incurred under this Act, or rules or regulations made thereunder, without taking legal proceedings for the imposition thereof, or stay or compound any proceedings for the imposition thereof or for the seizure or forfeiture of any apparatus, and may restore anything seized or forfeited:

Provided that in the application of this subsection to Scotland, the Lord Advocate shall be substituted for the Postmaster-General so far as regards discretion conferred on the Postmaster-General to stay or compound any proceedings for the imposition of any penalty or for the seizure or forfeiture of any apparatus.

(2) All fines recovered in pursuance of this Act shall be paid into the Exchequer.

6. (1) The provisions of this Act shall apply to any visual or sound signalling station used or intended to be used for the purpose of communication with ships at sea as they apply to wireless telegraphy stations.

(2) For the purposes of this section "visual or sound signalling station" includes any permanent or fixed apparatus for the purpose of visual or sound signalling, and the provisions of this Act shall apply to the maintenance of any visual or sound signalling station in existence at the passing of this Act as they apply to the establishment of a visual or sound signalling station:

Provided that nothing in this Act shall apply to visual or sound signalling stations or apparatus on board ships or in aircraft, or to any signal station established by Lloyd's under the powers conferred by the Lloyd's Signalling Stations Act, 1888, or to signalling stations and lighthouses under the control of the Board of Trade or of any General or Local Lighthouse Authority.

In this section the expressions "lighthouses" and "general or local lighthouse authority" have the same meaning as in the Merchant Shipping Act, 1894.

7. The provisions of this Act, shall apply to the installation and working of apparatus for utilising etheric waves for the purpose of the sending or receiving of energy without the aid of any wire connecting the points from and at which the energy is sent and received as they apply to the installation and working of apparatus for wireless telegraphy.

8. If at any time in the opinion of a Secretary of State an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the sending and receiving of messages by wireless telegraphy or visual or sound signalling or the utilisation of etheric waves for the purpose of the sending and receiving of energy, and notice to that effect is published in the Gazette, it shall be lawful for the Postmaster-General during the continuance of the emergency to make such rules as appear necessary with respect to the possession, sale, purchase, construction, and use of apparatus for any such purpose, or component parts of such apparatus, and to impose penalties and forfeitures recoverable summarily in respect of any breach of the rules, and make such further provision as appears necessary for the enforcement of the rules:

Provided that—

(a) rules under this section shall not provide for the imposition of a term of imprisonment exceeding six months, or a fine exceeding one hundred pounds, or, in the case of a continuing offence, ten pounds for each day during which the offence continues; and

(b) any rules made under this section shall be laid as soon as may be before both Houses of Parliament.

9. (1) This Act shall apply—

(a) to British ships and aircraft registered in Great Britain, Northern Ireland, the Channel Islands or the Isle of Man, wherever such ships or aircraft may be;

(b) to British ships and aircraft registered elsewhere than as aforesaid, and to foreign ships and aircraft, whilst in or over any part of Great Britain, Northern Ireland, the Channel Islands or the Isle of Man, or the territorial waters abutting on the coast thereof, to such extent as may be prescribed by regulations under this Act.

(2) Sections six hundred and eighty-four, six hundred and eighty-five, and six hundred and eighty-six of the Merchant Shipping Act, 1894 (which relate to the jurisdiction of courts and justices), and section six hundred and ninety-three of the same Act (which relates to distress for sums ordered to be paid by masters and owners of ships), shall apply to the jurisdiction of courts and justices in respect of ships, and to distress under this Act.

10. (1) Subject to the provisions of this Act with respect to ships and aircraft, this Act shall extend to Great Britain, Northern Ireland, the Channel Islands and the Isle of Man.

(2) In the application of this Act to Scotland the expression "misdemeanour" means crime and offence.

(3) In the application of this Act to the Channel Islands and the Isle of Man—

(a) The Lieutenant governor of the Island of Jersey or the Island of Guernsey, and the governor, lieutenant governor, or deputy governor of the Isle of Man, as the case may require, shall be substituted for the Board of Trade:

(b) Offences may be prosecuted, fines recovered, proceedings taken, and search warrants issued in such courts and in such manner as may for the time being be provided in the Channel Islands and the Isle of Man by law, or, if no express provision is made, then in and before the courts and in the manner in which the like offences, fines, proceedings, and warrants may be prosecuted, recovered, taken, or issued therein, by law, or as near thereto as circumstances admit, and the bailiff or his lieutenant, or any jurat of the Royal Court in the Island of Jersey or the Island of Guernsey, and the judge or any jurat of the Court of Alderney, and the high bailiff or two justices of the peace in the Isle of Man, shall respectively be submitted for a justice of the peace.

11. (1) The Wireless Telegraphy Act, 1904, and the Wireless Telegraphy Act, 1906, are hereby repealed:

Provided that nothing in this repeal shall affect any licence granted under the enactments so repealed, but every such licence shall have effect as if granted under the Act.

(2) For removing doubts as to the construction of the Wireless Telegraphy Act, 1904, it is hereby declared that any references in that Act to transmission in relation to messages shall be deemed always to have included references to the reception of messages:

Provided that nothing in this paragraph shall render any person liable, in respect of any act or omission prior to the twelfth day of December, nineteen hundred and twenty-four, to any penalty to which he would not but for this subsection have been liable.

12. This Act may be cited as the Wireless Telegraphy and Signalling Act, 1925, and this Act and the Telegraph Acts, 1863 to 1924, may be cited together as the Telegraph Acts, 1863 to 1925.

UP to the time of going to press we have been unable to obtain any information regarding special laws and regulations for the control of wireless in the following countries, excepting those of which particulars will be found under a more general heading (e.g., *Bahamas* included in *British West Indies*). In most cases it is assumed that the regulations in force in the countries owning or controlling the wireless stations are applicable and that it has not yet been deemed necessary to formulate any local regulations.

ABYSSINIA (see Maps 25, 29 and 30). The station at Gambela is controlled by the Sudan Government.

ADMIRALTY ISLANDS (see Maps 17 and 22). The station at Manus is controlled by the Australian Commonwealth. (See *New Guinea*.)

AEGEAN ISLANDS (see Maps 3 and 4). The stations at Chios and Samoa are controlled by Greece. Those at Rhodes and Stampalia, in the Dodecanese Islands, by Italy.

ALASKA. See under **UNITED STATES OF AMERICA** (Maps 34, 36 and 42).

ALBANIA (see Maps 3 and 14). An independent State governed by a Council of Regents. The station at Sasseno is controlled by the Italian Government. A station at Tirana is contemplated.

ALGERIA. See under **FRANCE** (Maps 24, 26 and 28).

ANGOLA, or Portuguese West Africa. A Portuguese colony under the jurisdiction of a High Commissioner. The Laws and Regulations controlling wireless telegraphy are those in force in Portugal (Maps 24 and 31).

ARABIA (see Maps 16, 25 and 27). With the exception of the stations in the British Protectorate at Aden and at Bahrein on the Arabian side of the Persian Gulf, there are no wireless stations in Arabia.

ASCENSION ISLAND is now a dependency of St. Helena. It is an important cable station of the Eastern Telegraph Company but has no wireless communication. The old Admiralty wireless station has long been dismantled (see Maps 24 and 33).

AZORES. See under **PORTUGAL** (Maps 24 and 33).

BAHAMAS. See under **BRITISH WEST INDIES** (Maps 35, 45 and 46).

BAHREIN ISLANDS. See under PERSIAN GULF (Maps 16 and 21).

BATHURST. See under GAMBIA (Maps 24 and 26).

BRITISH EAST AFRICA. See under KENYA COLONY and ZANZIBAR (Maps 25, 28, 30 and 33).

BULGARIA. A sovereign State under the Czar Boris III. Wireless telegraphy is worked in conformity with the International Radiotelegraphic Convention but up to the time of going to press we have not been able to obtain particulars of any special regulations in force (see Maps 3, 14 and 16).

CAMEROONS (see Maps 24 and 26). There are at present no stations in British Cameroons. For French Cameroons see under FRANCE. The station at Douala is under French control.

CANARY ISLANDS. See under SPAIN (Maps 24 and 30).

CAPE VERDE ISLANDS. See under PORTUGAL (Maps 24 and 33).

COCOS - KEELING ISLANDS. See under STRAITS SETTLEMENTS (Map 22).

CRETE. See under GREECE (Maps 3 and 14).

CURACAO. See under HOLLAND (Maps 45, 48 and 50).

CYRENAICA (see Maps 25 and 27). The North Eastern portion of Italian Libya. The stations at Bengasi, Cirene, Derna and Tobruk are owned and controlled by Italy.

DODECANESE (see Maps 3 and 14). The Sporadi group of the Aegean Islands, the stations in Rhodes and Stampalia, are owned and controlled by Italy.

DUTCH EAST INDIES. See under HOLLAND. (Maps 17 and 22).

DUTCH GUIANA (Surinam). No special regulations have been issued, as far as we are aware, for the control of wireless telegraphy in this country. The station at Paramaribo is operated by the Surinam Bauxite Co. (see Maps 48 and 51).

ERITREA (see Maps 25 and 29). An Italian Colony. The station at Assab, Massawa and Mersa Fatma are controlled by the Italian Government.

FAROE ISLANDS. See under DENMARK (Maps 2 and 15).

FERNANDO PO. See under SPAIN (Maps 24 and 26). The station of S. Isabel di Fernando Po is controlled by the Spanish Foreign Office.

FIUME. The wireless station is operated by the Societa Fiumana per le Radiocomunicazioni (see Maps 2 and 13).

FRENCH EQUATORIAL AFRICA (see Maps 24, 25, 26 and 29), including French Congo and French Cameroon). The stations at Loango and Douala are owned and controlled by France.

FRENCH GUIANA. See under FRANCE (Maps 48 and 51).

FRENCH INDO-CHINA. See under FRANCE (Maps 17 and 23).

FRENCH SETTLEMENTS IN OCEANIA (see Map 56). Including Society Islands, Marquesar Islands, Tuamotu group, Leeward

Islands, Gambier, Tubuai and Rapa Islands and Tahiti. The stations at Makatea and Papeete are owned and controlled by the French.

FRENCH SOMALILAND (see Maps 25, 29 and 30). The station at Jibuti is owned and controlled by the French.

FRENCH WEST AFRICA (see Maps 24 and 26). The territories are administered by a Governor-General assisted by a Council. Stations at Conakry, Dakar, Grand Bassam, Port-Etienne, Rufisque Tabu and Cotonou.

(For the Laws and Regulations controlling Wireless Telegraphy in the above French Colonies see under FRANCE and ALGERIA.)

FRIENDLY ISLANDS. See under PACIFIC ISLANDS (Map 56).

GEORGIA. Wireless telegraphy in this republic is a State monopoly under the control of the War Office. Up to the time of going to press, we have been unable to obtain information relating to any special laws, though it is understood that these are under consideration (see Maps 3 and 12).

GUADELOUPE (see Map 45). A French Dependency in the Lesser Antillos. Destrellan Station communicates with Fort de France and Trinidad.

GUAM (see Map 22). An Island in the Pacific at the Southern extremity of the Mariana Archipelago. The station is owned and controlled by the United States Navy.

GUATEMALA (see Maps 35, 43 and 44). An Independent Republic, having a private Government station in Guatemala City.

HAITI (see Maps 35 and 45). The Republic has passed no regulations affecting telegraphy. The stations are controlled by the United States.

HAWAIIAN ISLANDS (Sandwich Islands) (see Map 56). Are owned and controlled by the United States. Private stations are regulated by the Department of Commerce and Naval stations by the U.S. Navy.

ITALIAN SOMALILAND. See under ITALY (Maps 25, 28 and 30).

JAMAICA. See under BRITISH WEST INDIES (Maps 35 and 45).

LABRADOR. See under NEWFOUNDLAND (Maps 34 and 37).

LIBERIA. The station at Monrovia is controlled and operated by the French Government.

LUXEMBOURG (see Maps 2 and 11). The Grand Duchy of Luxembourg has not adhered to the London Radiotelegraph Convention, but has made a declaration to the Berne Bureau in accordance with Article 48 of that Convention.

MACAO (see Maps 17 and 20). A Portuguese Colony with a station at São Francisco.

MADAGASCAR (see Maps 25 and 31). Including Mayotte and the Comoro Islands. A French Colony. See under FRANCE.

MALAY STATES not included in the Federation. Including Johore, Kedah, Perlis, Kelantan and Trengganu, are under British Protection (see Maps 17, 22 and 23).

MARSHALL ISLANDS (see Map 56). See under PACIFIC ISLANDS. The Nauru Station on Pleasant Island is controlled by the Australian Commonwealth.

MARTINIQUE (see Maps 35 and 45). A French Colony under the Administration of a Governor. The station at Fort de France is owned and controlled by the French Navy.

MESOPOTAMIA. See IRAQ (Maps 16 and 21)

NEPAL (see Maps 17, 18 and 20). An independent Kingdom. There are at present no wireless stations, but a project is under consideration.

NEW BRITAIN. See under SOLOMON ISDS.

NEW GUINEA. See under SOLOMON ISDS. (Maps 17 and 22).

NEW IRELAND. See under SOLOMAN ISDS.

PORTO RICO. This island is under the control of a Governor appointed by the U.S.A. The regulation of wireless telegraphy rests in the hands of the Department of Commerce for private stations and in those of the U.S. Navy Department for the naval stations (see Maps 35 and 45).

PORTUGUESE GUINEA (see Maps 24 and 26). A Portuguese Colony on the West Coast of Africa, South of Gambia. Stations have been opened at Bissau and Bolama.

RUSSIA (see Maps 3, 12, 16, 17 and 19). Wireless telegraphy is extensively used throughout Russia and a large number of stations have been opened during the past year. We have not been able to obtain particulars for the Laws and Regulations now governing the use of wireless telegraphy. Reference to the 1921 Edition of the Year Book will give such Statutes and Regulations as were in existence under the late Imperial Government.

ST. LUCIA. See under BRITISH WEST INDIES.

ST. DOMINGO. See under DOMINICAN REPUBLIC.

ST. MARTIN. See under CURACAO AND HOLLAND.

S. PIERRE AND MIQUELON (see Maps 34 and 37). A French Colony on two groups of islands South of Newfoundland, the station on S. Pierre Island and at Miquelon are under French control.

SAMOAN ISLANDS (see Map 56). The station at Apia is owned and controlled by the New Zealand Administration, those at Ofu, Tau and Tutuila by the United States.

SERB, CROAT AND SLOVENE STATE (YUGO-SLAVIA) (see Maps 2, 3, 13 and 14). A kingdom formed by the fusion of Serbia, Montenegro, Bosnia and Herzegovina. We have been unable to obtain any information regarding the Laws and Regulations, if any, governing wireless in this Kingdom.

SPITZBERGEN (including Bear Island). See under NORWAY (Maps 2, 9 and 15). The station at Green Harbour, Spitzbergen, is controlled by the Norwegian Government. There are several private stations, including one on Bear Island owned by the Bear Island Code Company of Tromso.

SWAZILAND (see Maps 25 and 32) is under the Administration of the High Commissioner for South Africa.

SYRIA and LEBANON (see Maps 3, 16 and 25), are under French mandate and are administered by a High Commissioner. The wireless station at Beyrouth is operated by the Société Radio Orient and the administration of wireless telegraphy is under the supervision of the Inspector General of Posts and Telegraphs. The establishment and use of private stations is at present forbidden.

TIMOR (see Map 22). This island in the Malay Archipelago is divided between Holland and Portugal. The station at Koepang, the South-Western extremity, is owned by the Dutch, and Dili, on the North Coast, by the Portuguese.

TONGA ISLANDS. See under PACIFIC ISLANDS (Map 56). The station at Nukualofa is owned by the Government of Tonga.

TRIPOLITANA AND CYRENAICA (see Maps 24, 25, 26 and 27). Italian Libia is, for administration purposes, divided into the districts of Tripolitana and Cyrenaica, each under a governor. The stations are controlled by the Italian Government.

TURKEY (see Maps 3, 14 and 16). We have been unable to obtain any information relating to the organisation and administration of wireless in Turkey.

VIRGIN ISLANDS (see Map 45). The stations on the Islands of S. Thomas and S. Croix are owned and controlled by the United States Navy.

WESTERN SAMOA. Wireless telegraphy is under the control of the New Zealand Administration (see Map 56).

WINDWARD PASSAGE (see Map 45). The station on Navassa Island is owned and controlled by the United States.

YUGO-SLAVIA. See above, under SERBS, CROATS and SLOVENES (Maps 2, 3, 13 and 14).

**DIRECTORY OF
THE WORLD'S
WIRELESS LAND
STATIONS**

LAND STATIONS.

ABBREVIATIONS.

—Radiotelephony only.
(T)—Radiotelephony in addition to Radiotelegraphy.
D F—Direction-Finding Stations.

NOTES.

1st Column (names of stations)—
1—Station under Construction. 2—Station Temporarily Closed. 3—Station Projected.
For notes relating to countries marked (a), etc., see end of List.

3rd Column (Call Signals)—
Local Call Signs are printed in italics.

6th Column (Wavelength)—
T—Time Signal. W—Weather Reports, Navigational Warnings, etc. Pr—Press Messages.
FX—With Fixed Stations only. Bea—Radio Beacon. T'py—Radio Telephony. Rec—For reception only. Cal—Calibration Wavelengths.

N.B.—For Nature of Service refer to Alphabetical List of Call Signs.

Name.	Geographical Position. Meridian of Greenwich.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).
ADMIRALTY ISLANDS. (See under New Guinea)					
AEGEAN ISLANDS (DODECANESE)					
Rhodes	36° 27' 10" N. 28° 15' 35" E.	ICW	270	Italian Government ..	300, 600 spk.
Stampalia	—	IDA	—	Italian Army	—
ALASKA. (See under U.S.A.)					
ALBANIA					
Saseno	40° 29' 52" N. 19° 17' 17" E.	IDB	—	Italian Army	—
ALGERIA. (See under France)					
ANGOLA					
Ambriz	07° 52' 09" S. 13° 04' 50" E.	CRP	200	Government	800, 900, 1,200 spk.
Bafa dos Tigres ..	16° 32' 20" S. 11° 42' 50" E.	CRR	200	—	800, 900, 1,200 spk.
Cabinda	05° 32' 00" S. 12° 11' 00" E.	CRQ	250	Government	800, 900, 1,200 spk.
Camacupa	12° 02' 00" S. 17° 15' 00" E.	CRLP	250	—	900, 1,200 spk.
Dundo	07° 22' 30" S. 20° 58' 30" E.	CRLO	150	—	2,100 c.w.
Huambo	12° 45' 00" S. 15° 49' 00" E.	CRLI	250	Government	900, 1,200 spk.
Loanda	08° 48' 30" S. 13° 15' 18" E.	CRL	750	Government	800, 900, 1,200, 1,600, 2,000 spk.
Lobito	12° 18' 50" S. 13° 35' 30" E.	CRO	250	Government	800, 900, 1,200 spk.
Lubango	14° 54' 00" S. 13° 34' 00" E.	CRLN	250	—	900, 1,200 spk.
Malange	09° 32' 56" S. 16° 21' 00" E.	CRLM	250	Government	900, 1,200 spk.
Mossamedes	15° 11' 13" S. 12° 09' 17" E.	CRM	250	Government	800, 900, 1,200 spk.
Novo Redondo ..	11° 07' 00" S. 13° 54' 00" E.	CRN	250	Government	800, 900, 1,200 spk.
S. Antonio do Zaire..	06° 07' 30" S. 12° 18' 00" E.	CRLQ	200	—	800, 900, 1,200 spk.
Vila Henrique de Carvalho (Saurimo)	09° 39' 25" S. 20° 24' 00" E.	CRLS	200	—	800, 900, 1,200 spk.

**ARGENTINE
REPUBLIC**

Año Nuevo	54° 39' 25" S. 64° 03' 10" W.	LIO	432	Ministerio de Marina	600, 1,800 spk.
Buenos Aires ¹ ..	—	LIA	—	Ministerio de Marina	—
Cabo de las Virgenes	52° 20' 00" S. 68° 22' 00" W.	LJE	270	Ministerio de Marina	300, 600 spk.
Comm. 1st Army Division (Buenos Aires)	34° 34' 00" S. 58° 26' 00" W.	LNR	40	Ministerio de Guerra	400 spk.
Comm. 2nd Army Division (Buenos Aires)	34° 33' 00" S. 58° 41' 00" W.	LNS	40	Ministerio de Guerra	400 spk.
Comm. Inland Water- ways	45° 49' 00" S. 67° 35' 00" W.	LIJ	270	Ministerio de Marina	300, 600 spk.
Cordoba ¹	31° 26' 00" S. 64° 11' 00" W.	LNC	1,000	Ministerio de Guerra	—
Corrientes LIG ¹ ..	—	LIG	—	Ministerio de Marina	—
Corrientes LPC ..	27° 27' 52" S. 58° 50' 38" W.	LPC	100	Ministerio de Obras Publicas	1,000 spk.
Dársena Norte ..	34° 35' 35" S. 58° 22' 10" W.	LIH	432	Ministerio de Marina	600, 1,000 (T) spk.
Dir. Gen. of Arsenal (Buenos Aires)	34° 38' 00" S. 58° 24' 00" W.	LNA	40	Ministerio de Guerra	400 spk.
Eldorado, Misiones	26° 38' 00" S. 54° 43' 00" W.	LIT	270	Ministerio de Marina	1,000, 1,500 spk.
S. Antonio Light ¹ (Buenos Aires)	36° 18' 24" S. 56° 46' 25" W.	LJA	—	Ministerio de Marina	—
Formosa	26° 14' 00" S. 58° 07' 00" W.	LIU	270	Ministerio de Marina	450, 600 spk.
Gallegos ¹	—	LIC	—	Ministerio de Marina	—
Intersection Rio de la Plata Pontoon	Anchored near Buoy K37 Buenos Aires	LJL	30	Ministerio de Marina	300, 600 spk.
Liniers	34° 38' 00" S. 58° 33' 00" W.	LNL	40	Ministerio de Guerra	400 spk.
Marlín García ..	34° 11' 15" S. 58° 15' 00" W.	LIY	100	Ministerio de Marina	300, 600 spk.
Mendoza	32° 54' 00" S. 68° 50' 00" W.	LNM	400	Ministerio de Guerra	600, 1,200 spk.
Military College (Buenos Aires)	34° 34' 00" S. 58° 33' 00" W.	LNG	40	Ministerio de Guerra	400 spk.
Monte Grande	34° 45' 14" S. 58° 33' 46" W.	LPZ	—	—	6,400 27,500 c.w.
Palomar (El) ..	34° 36' 00" S. 58° 36' 00" W.	LND	40	Ministerio de Guerra	400 spk.
Parana	31° 42' 00" S. 60° 29' 00" W.	LPB	275	Ministerio de Obras Publicas	600 spk.
Paz (La) Entre Rios	30° 44' 00" S. 50° 39' 00" W.	LIW	270	Ministerio de Marina	450, 600 spk.
Posados Missions	27° 22' 00" S. 55° 54' 00" W.	LIV	270	Ministerio de Marina	300, 600 spk.
Practicos Recalada, Rio de la Plata Pontoon	35° 10' 20" S. 56° 13' 30" W.	LJK	100	Ministerio de Marina	300, 600 spk.
Puerto Aguirre ..	25° 35' 00" S. 54° 35' 00" W.	LIS	270	Ministerio de Marina	300, 600 spk.
Puerto Belgrano ..	33° 53' 30" S. 62° 06' 15" W.	LII	430	Ministerio de Marina	600, 1,000 spk.
Puerto Bermejo ..	26° 56' 25" S. 58° 35' 35" W.	LPD	100	Ministerio de Obras Publicas	700 spk.
Punta Delgada, Chubut	42° 45' 59" S. 63° 38' 22" W.	LJC	270	Ministerio de Marina	300, 600 spk.
Punta Mogotes	38° 05' 25" S. 57° 32' 45" W.	LJB	270	Ministerio de Marina	300, 600 spk.
Recalada Bahia Blanca Pontoon Lightship	39° 11' 00" S. 61° 39' 00" W.	LJM	50	Ministerio de Marina	300, 600 spk.
Rio Grande, Tierra del Fuego	53° 47' 10" S. 67° 45' 50" W.	LJF	270	Ministerio de Marina	300, 600 spk.
Rio Santiago ..	34° 50' 20" S. 57° 53' 45" W.	LIZ	270	Ministerio de Marina	600 spk.
Rosario de Santa Fé	32° 52' 00" S. 60° 39' 00" W.	LPA	100	Ministerio de Obras Publicas	900 spk.
San Julian	49° 18' 30" S. 67° 42' 53" W.	LJD	270	Ministerio de Marina	300, 600 spk.

**ARGENTINE
REPUBLIC**Trelew¹
Tucuman¹Ushuala
Zarate (Buenos Aires)**AUSTRALIAN
COMMONWEALTH**

Adelaide Radio ..

Brisbane Radio ..

Broome Radio ..

Cooktown Radio ..

Darwin

District Naval Office,
Hobart

Esperance Radio ..

Flinders Island Radio

Geraldton Radio ..

Hobart Radio ..

King Island Radio ..

Melbourne Radio ..

Naval Staff Office,
AdelaideNaval Staff Office,
BrisbaneNaval Staff Office,
PerthNaval Staff Office,
Port MelbourneNaval Staff Office,
Sydney

Perth Radio ..

Rockhampton Radio

Sydney Radio ..

Thursday Island
Radio

Townsville Radio ..

Willis Islets ..

Wyndham Radio ..

AUSTRIA

Deutsch Altenburg ..

AZORES. (See under

Portugal)

BAHAMAS. (See under

British West

BAHREIN. (See under

Persian Gulf)

BARBADOS. (See

under British West

BATHURST. (See

under Gambia)

LIB
LNT

LIK

LIX

VIA

VIB

VIO

VIC

VID

VZDM

VIE

VIL

VIN

VIH

VZE

VIM

VZDG

VZDF

VZDJ

VZDB

VZDC

VIP

VIR

VIS

VII

VIT

CGI

VIW

OHO

1,000

324

270

450

450

450

450

450

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450

450

450

300

200

450

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400,
1,500

450

400,
1,500

500

400,
1,500

300-600

450

—

Ministerio de Marina
Ministerio de Guerra

Ministerio de Marina

Ministerio de Marina

Government

Government

Government

Government

Government

Navy

Government

Government

Government

Government

Government

Government

Navy

Navy

Navy

Navy

Navy

Government

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Government

Government

Government

Government

Government

Government

—

—

300, 600
spk.
600 800
spk.300, 450, 600
spk.300, 450, 600
spk.300, 450, 600
spk.300, 450, 600
spk.300, 450, 600
spk.300, 450, 600
spk.300, 450, 600
spk.300, 450, 600
spk.300, 450, 600
spk.300, 450, 600
spk.300, 450, 600
spk.300, 450, 600
spk.

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300, 450, 600,
1,800-3,500
spk. and c.w.300, 450, 600
spk.300, 450, 600,
1,800-3,500
spk. and c.w.300, 450, 600
spk.300, 450, 600,
1,800-3,500
spk. and c.w.300, 450, 600
spk.300, 450, 600,
1,800-3,500
spk. and c.w.300, 450, 600
spk.300, 450, 600
spk.

3,050 (W) c.w.

BELGIAN CONGO

Banana	05° 59' 35" S. 12° 27' 15" E.	ONA	300 800	Government	800 2,400 spk.
Basankusu	1° 08' N. approx. 19° 40' E. approx.	OQV	—	Government	2,100 spk.
Basoko	1° 11' N. approx. 23° 40' E. approx.	OQO	—	Government	2,550 spk.
Bunia	1° 59' N. approx. 30° 09' E. approx.	BIA	—	Government	4,500 spk.
Buta	2° 48' N. approx. 24° 46' E. approx.	BTA	—	Government	1,800 spk.
Coquilhatville ..	0° 04' N. approx. 18° 20' E. approx.	OQC	—	Government	3,200 c.w.
Elizabethville ..	Haut Luapula	OQH	—	Government	3,000 spk.
Kigoma	4° 53' S. approx. 29° 40' E. approx.	KGA	—	Government	1,200 spk.
Kikondja	10° 48' S. approx. 33° 05' E. approx.	OQK	—	Government	2,400 spk.
Kindu	2° 58' S. approx. 25° 56' E. approx.	OQD	—	Government	1,950 spk.
Kinshasa	4° 19' S. approx. 15° 24' E. approx.	OQL	—	Government	3,600 spk.
Kongolo	5° 20' S. approx. 7° 01' E. approx.	OQG	—	Government	2,700 spk.
Lukuga	25° 50' S. approx. 7° 25' E. approx.	LGA	—	Government	3,800 spk.
Lusambo	24° 59' S. approx. 23° 23' E. approx.	OQM	—	Government	4,000 spk.
Stanleyville	0° 26' N. approx. 25° 14' E. approx.	OQS	—	Government	3,400 spk.
Umangi	2° 06' N. approx. 21° 25' E. approx.	OQI	—	Government	2,850 spk.
Usumbura	3° 15' S. approx. 31° 40' E. approx.	USA	—	Government	1,400 spk.

BELGIUM

Antwerp Radio ..	51° 13' 42" N. 04° 24' 00" E.	OSA	100-150	Government	800, 800 spk.
Brussels .. T	—	BAV	—	—	1,100 T'py
Brussels Hareh- ..	—	OPVH	—	—	900 T'py
Aerodrome .. T	—	—	—	—	—
Ostend Aerodrome ..	—	OPVO	—	—	1,400 c.w.
Ostend Radio ..	51° 13' 24" N. 02° 55' 06" E.	OST	Day 250 Night 500 Day 500 Night 1,000	Government	300, 450, 600, spk. (120) 300, 600, 800, 1,800 spk. (600) 1,680 c.w.
Uccle, Brussels- Institut Meteorolo- gique	—	OPO	—	—	—
Westhinder Light- ship	51° 22' 30" N. 02° 26' 26" E.	OTW	100-150	—	300, 600 spk.

BERMUDA

Bermuda Dockyard	32° 20' 00" N. 64° 45' 00" W.	BZB	200	British Admiralty ..	600, 1,600 (W) spk.
Somerset Island ..	32° 20' 00" N. 64° 25' 00" W.	BZR	500	—	—

BOLIVIA

Ballivián	22° 42' 00" S. 62° 11' 00" W.	CPA	Day 200	—	600, 900 spk.
Coblja	11° 01' 00" S. 68° 50' 00" W.	CPG	Day 160	—	1,500, 2,600 spk.
D'Orbigny	22° 52' 00" S. 62° 00' 00" W.	CPB	—	—	600, 900 spk.
Esteros	23° 52' 00" S. 61° 20' 00" W.	CPD	Day 200	—	600, 900 spk.
Riberalta	10° 59' 00" S. 66° 04' 00" W.	CPE	Day 430	—	2,212, 3,311 spk.
S. Ana	13° 44' 00" S. 65° 35' 00" W.	CPJ	—	—	2,600 spk.
Todos Santos ..	On the Chapare	—	—	—	—
Trinidad, Bolivia ..	15° 50' 00" S. 64° 56' 00" W.	CPI	—	—	2,600 spk.
Viacha	17° 25' 00" S. 68° 17' 00" W.	CPF	—	—	2,600 3,300 spk.
Villa Bella, Bolivia..	10° 10' 00" S. 65° 10' 00" W.	CPH	—	—	—
Yaculba	21° 58' 00" S. 63° 40' 00" W.	CPC	—	—	600, 900, 2,600, 3,300 spk.

BRAZIL						
Abrolhos	..	..	17° 57' 30" S. 38° 41' 46" W.	SNN	100	Navy 300 spk.
Amaralina	..	..	13° 01' 00" S. 38° 28' 00" W.	SPA	400	Government 300, 600 spk.
Anhatomirim	..	..	27° 25' 32" S. 48° 34' 20" W.	SOD	600	Navy 600, 1,000, 2,000 spk.
Armacão	..	..	22° 52' 57" S. 43° 08' 04" W.	SNW	50	Navy 300 spk.
Belém, Pará	..	..	01° 26' 59" S. 48° 30' 06" W.	SPB	400	Government 1,800 spk.
Boqueirão I.	..	..	22° 46' 24" S. 43° 09' 39" W.	SNQ	50	Navy 300 spk.
Cape St. Thomé	..	..	22° 02' 00" S. 40° 58' 35" W.	SPT	750	Government 300, 600 spk.
Cobras I.	..	..	22° 52' 00" S. 43° 09' 00" W.	SNI	150	Navy 600 spk.
Cruzeiro do Sul	..	..	07° 38' 28" S. 72° 36' 15" W.	SQC	400	Government 1,000 3,000 spk.
Fernando de Noronha	..	..	03° 50' 30" S. 32° 25' 12" W.	SPN	1,000	Navy 300, 600, 1,800 spk.
Fort Lage	..	..	22° 56' 03" S. 43° 09' 00" W.	PTL	150	Ministry of War .. 450, 900 spk.
Fort Imbuhy	..	..	22° 57' 02" S. 43° 06' 56" W.	PTI	150	Ministry of War .. 450, 900 spk.
Fort Ste. Cruz	..	..	22° 56' 03" S. 43° 08' 00" W.	PTC	150	Ministry of War .. 450, 900 spk.
Fort S. João	..	..	22° 56' 40" S. 43° 09' 12" W.	PTJ	150	Ministry of War .. 450, 900 spk.
Governador I.	..	..	22° 49' 25" S. 43° 07' 58" W.	SOH	800	Navy 600 (W), 1,800 (TW) 1,800 (W) 2,000 spk.
Juncção	..	..	32° 04' 00" S. 52° 07' 00" W.	SPJ	750	Government 300, 600 spk.
Labrea	..	..	Amazonas	SQL	—	Government 1,000 2,000 spk.
Ladario	..	..	Matto Grosso	SNU	—	Navy 1,800 spk.
Manaos	..	..	03° 08' 05" S. 60° 01' 45" W.	SQM	750	Government 2,400, 3,500 spk.
Mocangue I.	..	..	22° 52' 15" S. 43° 07' 58" W.	SOQ	50	Navy 300 spk.
Mont'Serrat	..	..	23° 56' 27" S. 46° 19' 34" W.	SPS	200	Government 300, 600 spk.
Natal Norte	..	..	Rio Grande do Norte	SNR	—	Navy 600 spk.
Nictheroy	..	..	22° 52' 52" S. 43° 07' 40" W.	PTN	150	Ministry of War .. 450, 600, 900 spk.
Olinda Pernambuco	..	..	08° 00' 35" S. 34° 51' 00" W.	SPO	590	Government 300, 600 spk.
Porto Velho	..	..	03° 46' 00" S. 63° 55' 00" W.	SQV	750	Government 2,400 3,500 spk.
Quartel General (Rio de Janeiro)	..	..	22° 54' 25" S. 43° 11' 30" W.	PTQ	150	Ministry of War .. 450, 600, 900 spk.
Raza I.	..	..	23° 03' 40" S. 43° 08' 45" W.	SNZ	150	Navy 600 spk.
Rio Branco, Acre	..	..	09° 58' 28" S. 67° 52' 05" W.	SQR	210	Government 1,000 2,000 spk.
Rio de Janeiro	..	..	22° 55' 40" S. 43° 10' 10" W.	SPY	200	— 300, 600 spk.
Santarém, Para	..	..	02° 24' 48" S. 54° 42' 58" W.	SQS	400	Government 2,000 3,000 spk.
Senna Madureira	..	..	09° 03' 57" S. 68° 39' 35" W.	SQN	400	Government 1,500 3,000 spk.
S. Luiz do Maranhao	..	..	—	SOM	—	Navy 600 spk.
Tarauacá	..	..	08° 20' 55" S. 70° 43' 30" W.	SQT	210	Government 1,500, 3,000 spk.
Villa Militar	..	..	22° 49' 27" S. 43° 24' 52" W.	PTV	150	Ministry of War .. 450, 600, 900 spk.
Villegaignon	..	..	22° 52' 00" S. 43° 09' 40" W.	SNV	27	Navy 850 spk.
Xapury	..	..	10° 39' 10" S. 68° 36' 30" W.	SQX	210	Government 1,000 2,000 spk.

BRITISH EAST

AFRICA. (See under
Kenya Colony,
Zanzibar and
Pemba)

BRITISH GUIANA

Georgetown, Demerara	06° 40' 00" N. 58° 11' 17" W.	BZL	500	Government	600, 1,400, 1,800 spk. and c.w.
Kamakusa	5° 58' 0" N. 60° 02' 00" W.	XA	200	Government	—
Mackenzie City ..	—	—	—	Government	—

**BRITISH
HONDURAS**

Belize	17° 30' 35" N. 88° 11' 17" W.	VPP	400	Government	600, 1,500 (W) 2,400 spk. and c.w.
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**BRITISH NORTH
BORNEO and
SARAWAK**

Jesselton	05° 56' 50" N. 116° 03' 10" E.	VQA	400	Government	600, 1,200, 3,000 spk.
Kudat	06° 53' 21" N. 116° 50' 15" E.	VQD	400	Government	600, 1,200, 2,850 spk.
Lahad Datu	5° 02' 00" N. 118° 20' 00" E.	VSR	300	Government	600, 2,500 c.w.
Lamag	5° 27' 15" N. 117° 50' 00" E.	—	40	Government	1,400
Sandakan	05° 50' 00" N. 118° 06' 40" E.	VQB	400	Government	600, 1,200, 2,900 spk.
Silimponon	04° 18' 00" N. 117° 25' 00" E.	VSN	50	—	1,800 spk.
Tawao	04° 14' 40" N. 117° 54' 00" E.	VQC	400	Government	600, 1,200, 2,700 spk.

BRUNEI

Brunei Radio ..	04° 51' 30" N. 114° 53' 30" E.	VSJ	100	—	2,300 c.w.
Labuan Radio ..	05° 18' 00" N. 115° 14' 30" E.	VSK	100	—	2,300 c.w.
Temburong Radio ..	04° 43' 00" N. 115° 50' 00" E.	VSL	100	—	2,300 c.w.

SARAWAK

Binatang (T) ..	—	—	—	—	1,550-2,200 c.w.
Bintulu (T) ..	3° 12' 00" N. 113° 03' 00" E.	VSS	150	—	1,550-2,200 c.w.
Goebilt (T) ..	01° 38' 23" N. 110° 27' 33" E.	VSD	150	Government	1,550-2,200 c.w.
Kapit (T) ..	—	—	—	—	1,550-2,200 c.w.
Kuching (T) ..	01° 33' 20" N. 110° 20' 30" E.	VQF	500	Government	600, 1,000, 1,550, 1,800, 2,800, 3,200 spk.

Miri (T) ..	04° 25' 30" N. 114° 00' 00" E.	VQP	300	Government	600, 1,800 spk. 1,550-2,200 c.w.
Mukah (T) ..	2° 55' 00" N. 112° 08' 00" E.	VST	150	—	1,550-2,200 c.w.
Sadong (T) ..	01° 22' 45" N. 110° 47' 15" E.	VQW	200	Government	1,550-2,200 c.w.
Selalang (T) ..	2° 04' 00" N. 111° 21' 00" E.	VSU	150	—	1,550-2,200 c.w.
Sibu (T) ..	02° 17' 30" N. 111° 49' 05" E.	VQV	200	Government	1,550-2,200 c.w.
Simanggang (T) ..	1° 13' 30" N. 111° 38' 00" E.	VSV	150	—	1,550-2,200 c.w.

**BRITISH
SOMALILAND**

Aden Radio ..	12° 49' 25" N. 45° 02' 09" E.	BZF	500	Government	600, 2,000 (W) 2,700 c.w.
Berbera Radio ..	10° 26' 06" N. 45° 01' 28" E.	VPJ	250	Government	300, 600 spk.
Burao ..	09° 31' 40" N. 45° 33' 00" E.	VQX	250	Government	600 spk.
Hargeisa ..	09° 33' 00" N. 44° 01' 10" E.	VSA	250	Government	600 spk.
Zeyla ..	11° 20' 00" N. 43° 28' 00" E.	VQY	250	Government	600 spk.

**BRITISH SOUTH-
WEST AFRICA**
(See under South
Africa)

BRITISH WEST INDIES					
ANTIGUA					
Antigua	—	GOA	250	Government	600, 980 c.w.
BAHAMAS					
Bimini	25° 44' 00" N. 79° 19' 00" W.	VSC	150	Government	300, 600, 952 spk.
Elbow Cay, Abaco ..	26° 32' 00" N. 76° 57' 00" W.	VSO	100	Government	300, 600, 952 spk.
Governors Harbour ..	25° 12' 00" N. 76° 16' 00" W.	VSE	100	Government	300, 600 spk.
Harbour Island ..	25° 30' 00" N. 76° 39' 00" W.	VSF	100	Government	300, 450, 600 spk.
Inagua	20° 57' 00" N. 73° 41' 00" W.	VSG	150	Government	300, 600, 952 spk.
Nassau	25° 05' 00" N. 77° 22' 30" W.	VPN	400	Government	300, 450, 600, 706, 1,200, 1,600, 1,800 spk.
Normans Castle ..	26° 43' 00" N. 77° 26' 30" W.	VSP	100	Government	300, 450, 600 spk.
West End, Grd. Bahama	28° 00' N. approx. 79° 00' W. approx.	VSQ	150	Government	300, 600, 952 spk.
BARBADOS					
Barbados	13° 05' 45" N. 59° 37' 23" W.	VPO	250	Pacific Cable Boards ..	600 1,050 c.w.
JAMAICA					
Christiania	—	BZQ	—	—	Rec. only
Kingston	17° 57' 43 6" N. 76° 47' 29.3" W.	VQI	300	—	600 (W) spk.
ST. LUCIA					
St. Lucia	14° 00' 11" N. 61° 00' 13" W.	VQH	350	—	300, 600 800 (FX) 1,000 spk.
TRINIDAD					
Tobago	11° 12' 00" N. 60° 40' 00" W.	VPM	150	Government	600 spk.
Toco	10° 50' 00" N. 60° 55' 00" W.	VQG	150	Government	600 1,800 spk.
Trinidad	10° 40' 00" N. 61° 30' 00" W.	VPL	350	Government	600, 1,800 (FX) spk.
TURKS & CAICOS ISLANDS.					
Grand Turk (T) ..	21° 28' 00" N. 71° 08' 00" W.	VSI	350	—	425 c.w.
BRUNEL. (See under British North Borneo)					
BULGARIA					
Varna	43° 12' 00" N. 27° 55' 00" E.	LZF	270	Government	300, 600 spk.
CAMEROONS (FRENCH)					
Douala	04° 03' 35" N. 09° 40' 50" E.	HWZ	150 400	—	600, 800 spark, 600, 1,000, 1,500 c.w.
CANADA (see note A).					
Alert Bay	50° 35' 20" N. 126° 55' 35" W.	VAF	350	Government	300, 600, 1,600 spk.
British Columbia	51° 52' 55" N. 55° 21' 50" W.	VCM	250	Government	300, 600 (W) spk.
Belle Isle	50° 55' 20" N. 127° 56' 20" W.	VAG	450	Government	300, 600, 1,600 spk.
Newfoundland	44° 31' 10" N. 63° 32' 45" W.	VCS	250	Government	300, 600 spk.
Bull Harbour ..	45° 19' 24" N. 60° 58' 25" W.	VAX	150	Government	800 spk.
Br. Columbia	51° 38' 41" N. 55° 25' 03" W.	VCZ	25	Government	1,000 spk.
Camperdown	49° 42' 20" N. 124° 52' 43" W.	VAC	350	Government	300, 600, 1,600 spk.
Nova Scotia	46° 39' 25" N. 53° 04' 15" W.	VCE	500	Government	300, 600, 1,600 spk.
Canso D.F., Nova Scotia	46° 39' 10" N. 53° 05' 05" W.	VAZ	250	Government	800 spk.
Cape Bauld, New- foundland (Beacon)	46° 39' 29" N. 53° 04' 24" W.	VCE	500	Government	600 spk.
Cape Lazo, Br. Columbia					
Cape Race, Newfoundland					
Cape Race, D.F. (Newfoundland)					
Cape Race (Newfoundland)					

CANADA—contd.

Cape Ray, Newfound- land (Beacon)	47° 37' 02" N. 59° 18' 20" W.	VCR	—	Government	1,000 spk.
Cape Sable, Nova Scotia	43° 23' 20" N. 65° 37' 15" W.	VCU	250	Government	300, 600, spk.
Chebucto Head, D.F. Nova Scotia	44° 30' 01" N. 63° 31' 20" W.	VAV	150	Government	800 spk.
Clarke City, Quebec	50° 11' 32" N. 66° 37' 39" W.	VCK	250	Government	300, 600 spk.
Dead Tree Point, Br. Columbia	53° 21' 30" N. 131° 55' 55" W.	VAH	200	Government	300, 600, 1,600 spk.
Digby Island, Br. Columbia	54° 17' 03" N. 130° 22' 35" W.	VAJ	250	Government	300, 600, 1,600 spk.
Estevan, Br. Columbia	49° 22' 05" N. 126° 32' 00" W.	VAE	500	Government	300, 600, 1,600 spk.
Fame Point .. Quebec	49° 06' 50" N. 64° 36' 20" W.	VCG	250	Government	300, 600 (W) spk.
Father Point .. Quebec	48° 31' 00" N. 68° 27' 40" W.	VCF	250	Government	300, 600, spk.
Glace Bay, Nova Scotia	46° 09' 02" N. 59° 56' 58" W.	GB	2,500	Marconi Co. of Canada	7,600 c.w.
Gonzales Hill, Br. Columbia	48° 24' 50" N. 123° 19' 25" W.	VAK	250	Government	300, 600, 1,600 spk.
Grindstone Island ..	47° 23' 00" N. 61° 54' 20" W.	VCN	200	Government	300, 600, spk.
Grosse Isle, Quebec	47° 02' 00" N. 70° 40' 05" W.	VCD	100	Government	300, 600 spk.
Halifax Dockyard, Nova Scotia	44° 39' 30" N. 63° 35' 10" W.	VAA	—	Government	—
Heath Point Lightship, Quebec	49° 03' 00" N. 61° 30' 30" W.	VCI	150	Government	300, 600, (W) 800 1,000 (Bea.) spk.
Kingston, Ontario ..	44° 14' 05" N. 76° 27' 30" W.	VBH	350	Government	300, 600, 1,600 spk.
Louisburg, Nova Scotia No. 1 No. 2	46° 09' 16" N. 59° 56' 48" W.	VAS	1,000 1,500	Marconi Co. of Canada	2,100 (rec.), 2,200, 2,400, 2,600, 2,800 (Pr.) c.w.
Lurcher Lightship, Nova Scotia	43° 48' 20" N. 66° 31' 54" W.	VDR	100	Government	300, 600, 1,000 (Bea.) spk.
Midland, Ontario ..	44° 44' 40" N. 79° 51' 45" W.	VBC	350	Government	300, 600, 1,600 spk.
Montreal, Quebec ..	45° 34' 05" N. 73° 38' 05" W.	VCA	200	Government	300, 800 spk.
North Sydney, Nova Scotia	46° 13' 10" N. 60° 14' 50" W.	VCO	200	Government	300, 600 spk.
Pachena D.F., Vancouver Is.	48° 44' 00" N. 125° 06' 25" W.	VAD	200	Government	800 spk.
Pas (Le), Manitoba	53° 52' 45" N. 101° 21' 30" W.	VBM	600	Government	900, 1,800, 2,400 spk.
Point Armour, Newfoundland	51° 27' 25" N. 56° 50' 30" W.	VCL	150	Government	300, 600, spk.
Point Edward, Ontario	43° 00' 10" N. 82° 24' 55" W.	VBE	350	Government	300, 600, 1,600 spk.
Point Grey, Br. Columbia	49° 15' 55" N. 123° 15' 20" W.	VAB	150	Government	300, 600, 1,600 spk.
Port Arthur, Ontario	48° 26' 30" N. 89° 13' 45" W.	VBA	350	Government	300, 600, 1,600 spk.
Port Burwell, Ontario	42° 38' 35" N. 80° 47' 14" W.	VBFB	350	Government	300, 600, 1,600 spk.
Port Nelson, Manitoba	57° 03' 20" N. 92° 34' 30" W.	VBN	150 600	Government	300, 600, 1,800 spk.
Quebec	46° 48' 25" N. 71° 12' 25" W.	VCC	150	Government	300, 600 spk.
St. John, New Brunswick	45° 15' 03" N. 66° 00' 47" W.	VAR	200	Government	600, 800 spk.
St. John D.F.	45° 15' 03" N. 66° 00' 47" W.	VAR	200	Government	600, 800 spk.
St. Paul's Island D.F., Nova Scotia	47° 12' 15" N. 60° 08' 45" W.	VAT	250	Government	800 spk.
Sable Island, Nova Scotia	43° 56' 20" N. 60° 01' 40" W.	VCT	300	Government	300, 600 spk.
Sambro Outer Bank Lightship, Nova Scotia	44° 20' 25" N. 63° 30' 19" W.	VCX	50	Government	1,000 (Bea) spk.
Sault Ste Marie, Ontario	46° 31' 05" N. 84° 17' 50" W.	VBB	350	Government	300, 600, 1,600 spk.
Seal Island	43° 23' 28" N. 66° 00' 53" W.	VAL	25	Government	1,000 (Bea.) spk.

CANADA—contd.

Tobermory, Ontario	45° 15' 55" N. 81° 39' 40" W.	VBD	350	Government	300, 600, 1,600 spk.
Toronto	43° 36' 50" N. 79° 23' 10" W.	VBG	350	Government	300, 600, 1,600 spk.
Yarmouth D.F., Nova Scotia	43° 46' 24" N. 66° 07' 16" W.	VAU	150	Government	600, 800 (D.F.) spk.

CANARY ISLANDS
(See under Spain)**CAPE VERDE IS.**
(See under Portugal)**CEYLON**

Colombo Radio ..	06° 55' 14" N. 79° 52' 53" E.	VPB	500	Government	300, 600 spk. 2,300 (T) c.w.
Matara	05° 59' 00" N. 80° 32' 00" E.	BZE	—	—	600, 2,000 (W) c.w.

CHATHAM ISLDS.
(See under Pacific
Isls.)**CHILE**

Antofagasta ..	23° 27' 35" S. 70° 31' 30" W.	CCB	400	Navy	300, 600, 1,300 spk.
Arica	18° 29' 00" S. 70° 20' 35" W.	CCA	400	Navy	300, 600, 1,300 spk.
Bories	51° 45' 00" S. 72° 32' 00" W.	CCV	300	Navy	300, 600, 1,300 spk.
Coquimbo	29° 57' 35" S. 71° 20' 00" W.	CCC	400	Navy	300, 600, 1,300 spk.
Evangelistas ³ ..	52° 22' 30" S. 75° 05' 55" W.	CCY	—	—	300, 600 spk.
Felix ¹	52° 58' 00" S. 74° 05' 00" W.	CCZ	—	—	300, 600, 1,300 spk.
Huafo	43° 33' 37" S. 74° 49' 30" W.	CCQ	250	Navy	300, 600, 1,300 spk.
Juan Fernandez ..	33° 37' 30" S. 78° 49' 50" W.	CCD	250	Navy	300, 600 spk.
Llanquihue	41° 32' 00" S. 72° 55' 00" W.	CCO	2,000	Navy	3,500, 5,000 spk.
Mocha (La)	38° 22' 12" S. 73° 53' 44" W.	CCN	200	Navy	300, 600 spk.
Punta Arenas Aposta- dero ²	53° 10' 00" S. 70° 50' 00" W.	CCX	—	—	300, 600, 1,300 spk.
Punta Arenas Catalina	53° 10' 00" S. 70° 50' 00" W.	CCW	2,000	Navy	3,500, 5,000 spk.
Raper	46° 49' 45" S. 75° 37' 30" W.	CCS	250	Navy	300, 600, 1,300 spk.
Rio Aysen ¹	46° 49' 45" S. 75° 37' 30" W.	CCR	—	Navy	300, 600 spk.
Santiago Espejo ..	33° 26' 00" S. 70° 38' 10" W.	CCI	—	—	—
Santiago Moneda ..	33° 26' 00" S. 70° 38' 10" W.	CCG	300	—	300, 600, 1,300 spk.
Santiago University	33° 26' 00" S. 70° 38' 10" W.	CCH	—	—	—
Talcahuano Torpedo School	36° 44' 00" S. 73° 05' 35" W.	CCL	250	—	300, 600, 1,300 spk.
Talcahuano Rocuant	36° 44' 00" S. 73° 05' 35" W.	CCK	700	Navy	300, 600, 1,300 spk.
Valparaiso, P. Ancha	33° 01' 03" S. 71° 39' 25" W.	CCE	300	Navy	300, 600, 1,000 (Pr), 1,300 spk.

CHINA

Canton	23° 10' 00" N. 113° 20' 00" E.	XNP	Day 650 Ngt. 1,300	Government	600, 1,200, 1,600, 2,100 spk.
Chefoo	37° 32' 00" N. 121° 20' 00" E.	XOF	Day 650 Ngt. 1,300	Government	600, 1,200, 1,600, 2,100 spk.
Foochow	26° 07' 00" N. 119° 18' 00" E.	XOW	Day 650 Ngt. 1,300	Government	600, 1,200, 1,600, 2,100 spk.
Kalgan	40° 45' 00" N. 115° 20' 00" E.	XQL	Day 650 Ngt. 1,300	Government	1,200, 1,600, 2,100, 3,000 spk.
Peking NPP	39° 55' 00" N. 116° 47' 00" E.	NPP	1,500 Ngt. 1,300	U.S. Navy	952, 1,910, 3,950, 4,543 spk. & c.w.
Peking XPK	39° 50' 00" N. 116° 27' 00" E.	XPK	Day 650 Ngt. 1,300	Government	600, 1,200, 1,600, 2,100 spk.

CHINA—contd.

Peking XYZ	—	XYZ	—	Japanese Government	16,000 c.w.
Quang-Tcheou-Wan	21° 03' 34" N. 110° 27' 45" E.	FWA	500	Government	300, 600, 1,800 spk.
Shanghai NPJ	31° 15' 00" N. 121° 29' 00" E.	NPJ	100	French Indo China	952, 3,950
Shanghai	31° 15' 00" N. 121° 29' 00" E.	XSH	200	U.S. Navy	(Rec. only) 600 spk.
Shanghai-Zikawei	31° 13' 14" N. 121° 27' 48" E.	FFZ	Day 500 Ngt. 1,000	Government	600 (Pr. T), 750 900, 1,800 spk.
Tientsin	—	WUQ	1,000	Soc. Francaise Radio- Electriques	756
Tsingtau	36° 03' 12" N. 120° 20' 00" E.	XRT	Day 1,000 Ngt. 2,000	U.S. Army	300, 600, 1,800, 2,800, 3,500, 4,000 spk.
Tsungming	31° 30' 00" N. 121° 20' 00" E.	XSU	300	Government	600 spk.
Woosung	31° 21' 00" N. 121° 25' 00" E.	XSG	Day 650 Ngt. 1,300	Government	600, 1,200 1,600, 2,100 spk.
Wuchang	30° 30' 00" N. 114° 23' 00" E.	XOC	Day 650 Ngt. 1,300	Government	600, 1,200, 1,600, 2,100, 3,000 spk.

CHRISTMAS ISLD.
(See under Straits Settlements.)**COCOS - KEELING ISLDS.** (See under Straits Settlements.)**COLOMBIA (REPUBLIC OF)**

Barranquilla	10° 59' N. approx. 74° 50' W. approx.	HJC	500	Marconi's	3,980 c.w.
Bogota	4° 34' N. approx. 74° 05' W. approx.	HJG	1,000	Marconi's	4,200, 4,600 c.w.
Cali	3° 25' N. approx. 76° 40' W. approx.	HJE	300	Marconi's	2,700 c.w.
Cartagena	10° 40' 00" N. 75° 30' 00" W.	CTG	Day 600 Ngt. 1,200	Government	600, 1,500, 2,000, 2,500, 3,000 spk.
Cucuta	7° 47' N. approx. 72° 50' W. approx.	HJF	300	Marconi's	2,900 c.w.
Medellin	6° 15' N. approx. 75° 45' W. approx.	HJD	500	Marconi's	3,000 c.w.
Puerto Colombia	11° 00' 08" N. 74° 57' 57" W.	HJB	450	Marconi's	600, 1,200 spk.
San Andres	—	HJA	450	Marconi's	1,200 spk.
Santa Marta	11° 14' 37" N. 74° 13' 34" W.	UJ	600	United Fruit Co. ..	1,300, 2,200 spk.

COSTA RICA

Port Limon	10° 00' N. approx. 83° 02' W. approx.	X	300	United Fruit Co. ..	1,000
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CUBA

Baracoa	20° 21' 46" N. 74° 29' 13" W.	PWE	300	Government	300-750 spk.
Camaguey	21° 23' 31" N. 77° 55' 54" W.	PWY	200	Government	750 spk.
Chaparra	21° 12' 30" N. 76° 27' 40" W.	PWD	300	Government	300-750 spk.
Fe (La)	22° 02' 00" N. 84° 14' 30" W.	PWG	300	Government	300-3,800 spk.
Guantanamo	19° 54' 38" N. 75° 08' 35" W.	NAW	300-1,000	U.S. Navy	600, 952, 2,100, 2,701, 3,950, 4,543 (W) spk. and c.w.
Havana	23° 09' 26" N. 82° 21' 29" W.	PWA	1,000	—	700-2,800 spk.
Nueva Gerona	21° 52' 30" N. 82° 42' 00" W.	PWB	400	Government	300-600 spk.
Pinar del Rio	22° 25' 45" N. 83° 38' 20" W.	PWF	300	Government	300-750 spk.
S. Clara, Cuba	22° 24' 00" N. 79° 59' 30" W.	PWC	300	Government	300-750 spk.
Santiago di Cuba	20° 01' 42" N. 75° 49' 44" W.	PWZ	600	Government	600-1,900 spk.

CURACAO. (See under Dutch West Indies)**CYRENAICA.** (See under Tripolitana)

CZECHOSLOVAKIA

Brataslava	48° 09' N. approx. 17° 07' E. approx.	OKR	—	Government	180-2,000 1,300 c.w.
Brno (Brünn)	49° 12' N. approx. 16° 37' E. approx.	OKB	—	Government	1,100-4,000 3,000 c.w.
Karlovy Vary (T) ..	45° 30' N. approx. 15° 33' E. approx.	OKV	—	Government	1,100-4,000 3,000 c.w.
Kosice (Kassa)	48° 74' N. approx. 21° 16' E. approx.	OKK	—	Government	300-2,000 1,500 c.w.
Liberec	50° 47' N. approx. 15° 03' E. approx.	OKL	—	Government	600-1,800 1,200 c.w.
Marianské Lázně ..	49° 58' N. approx. 12° 42' E. approx.	OKZ	—	Government	Rec. only
Moravská Ostrava ..	49° 51' N. approx. 18° 18' E. approx.	OKM	—	Government	180-2,000 1,200 c.w.
Prague (T)	50° 05' 00" N. 14° 27' 00" E.	OKP PRG	—	Government	2,500-7,000 6,000, 550-3,900, 2,500 4,500 (W. Pr.), 4,600 (Pr.) c.w.

DANZIG (FREE TOWN OF)

Danzig	—	DG	—	—	1,950 (W) c.w.
Danzig	54° 20' 56" N. 18° 39' 08" E.	KAZ	Day 600 Ngt. 1,000	—	300, 450, 600 (W) 800, 1,800 spk.

DENMARK

(See note B)

Anholt-Knob	56° 45' 58" N. 11° 51' 51" E.	OUR	100	Government	300, 600 spk.
Blaavand Radio ..	55° 33' 29" N. 08° 05' 11" E.	AXB	Day 200 Night 500	Government	300, 450, 600 1,800 spk.
Copenhagen Radio ..	55° 40' 49" N. 12° 36' 32" E.	OXA	Day 200 Night 500	Government	300, 600, 1,800 spk. and c.w.
Drogden	55° 33' 03" N. 12° 42' 57" E.	OUW	15	Government	300, 600 spk.
Gilleleje-Flak N. ..	56° 09' 48" N. 12° 18' 00" E.	OUE	30	Government	300, 600 spk.
Gjedser	54° 34' 25" N. 11° 55' 48" E.	OXC	135	State Railways of Den- mark.	300, 450, 600, 800, 1,000 spk.
Gjedser Havn.	54° 32' 24" N. 11° 56' 20" E.	OXD	25	—	250 spk.
Gjedser Rev.	54° 27' 12" N. 12° 11' 03" E.	OUU	12	Government	600 (Bea) spk.
Graadby	55° 20' 02" N. 08° 04' 41" E.	OUX	30	Government	300, 600 (Bea) spk.
Horns Rev.	55° 34' 06" N. 07° 19' 30" E.	OUZ	30	Government	300, 600 spk.
Laeso-Rende	57° 12' 48" N. 10° 41' 38" E.	OUK	100	Government	300, 600 spk.
Laeso Trindel	57° 26' 30" N. 11° 16' 45" E.	OUT	100	Government	300, 600 spk.
Lyngby Radio	55° 45' 57" N. 12° 28' 34" E.	OXE	—	State Telegraphs ..	2,400 T ^{py} 3,500, 3,600 (W) 4,200, 4,600, 5,000 (W.), 5,600 (Pr.) c.w.
Ostre Flak Lt. V. ..	56° 58' 22" N. 10° 53' 36" E.	—	—	—	—
Schultz-Grund	56° 08' 54" N. 11° 11' 10" E.	OUC	100	Government	300, 600 spk.
Skagens Rev.	57° 46' 00" N. 10° 43' 20" E.	OUB	100	Government	300, 600 spk.
Vyl	55° 23' 38" N. 07° 44' 13" E.	OUY	30	Government	300, 600 spk.

FAROE ISLANDS

Thorshavn	62° 00' 52" N. 6° 46' 08" W.	OXJ	100	State Telegraphs ..	300, 500, 600 spk.
Tveraa	61° 33' 12" N. 06° 48' 00" W.	OXK	—	—	300, 500, 600 spk.

DODECANESE. (See under Aegean Islands)**DOMINICAN REPUBLIC**

Romana (La)	18° 25' 00" N. 68° 57' 20" W.	HIB	300	Guanica Centrale ..	300, 600, 1,600 spk.
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DUTCH EAST INDIES

Ambaina	03° 47' 30" S. 128° 05' 00" E.	PKE	420	Government	600, 1,600, 2,300 spk.
Balikpapan Radio ..	01° 16' 10" S. 116° 50' 45" E.	PKF	420	De Bataafsche Petro- leum Maatschappij	600, 2,000, 3,700, 3,300 spk.
Borneo				Government	1,400 c.w.
Banda Neira	04° 31' 53" S. 129° 53' 32" E.	PKJ	—		
Bengkalis (Bengkalis Island)	102° 07' 00" E. 1° 29' 00" N.	PKI	400	—	1,400
Bima	08° 27' 00" S. 118° 44' 00" E.	PKR	400	—	1,400 c.w.
Sumbawa					
Cneribon Radio	6° 42' 00" S. 108° 38' 37" E.	PKV	100	War Dept.	300, 400, 600, 1,000 spk.
Java					1,400, 2,400, c.w.
Dobo	05° 45' 15" S. 134° 13' 00" E.	PKO	400	—	1,400 c.w.
Aru Islands					
Endeh	08° 48' 00" S. 121° 40' 00" E.	PKQ	400	—	
Flores Island					
Koepang Radio	10° 09' 30" S. 123° 35' 30" E.	PKD	420	Government	600, 1,600, 2,300 spk.
Timor					
Malabar	06° 56' 00" S. 107° 36' 00" E.	PKX	10,800	—	7,700, 9,000 (T), 10,000, 13,400, 15,800. 20,000 1,400 c.w.
Java					
Manokwari	00° 53' 34" S. 134° 06' 26" E.	PKK	400	—	600
New Guinea					
Medan Radio	98° 40' 00" E. 1° 29' 00" N.	PKP	200	—	
Sumatra					
Sabang Radio	05° 53' 50" N. 95° 20' 18" E.	PKA	Day 400 Night 800	Government	600 spk.
Sumatra					
Semarang Radio	06° 58' 00" S. 110° 25' 30" E.	PKN	100	Government	300, 600 spk.
Java					
Sito bondo	07° 41' 20" S. 114° 05' 30" E.	PKC	420	Government	600, 1,600, 2,300 spk.
Java					
Soerabaja Radio	07° 11' 55" S. 112° 44' 21" E.	PKH	400	Government Marine Dept.	600 spk.
Java					
Tarakan Radio	03° 18' 25" N. 117° 36' 15" E.	PKG	300	De Bataafsche Petro- leum Maatschappij	600, 2,000, 3,700, 2,850 spk.
Tavoena	3° 30' 00" N. 125° 23' 00" E.	PKZ	100	War Dept.	300, 600, 1,000 spk.
Tjilatjap Radio	07° 44' 00" S. 100° 01' 00" E.	PKM	150	War Department ..	300, 400, 600, 1,200 spk.
Java					1,400 c.w.
Waingapoe	09° 38' 00" S. 120° 12' 00" E.	PKU	400	—	
Java					
Weltevreden Radi ..	06° 12' 10" S. 106° 51' 55" E.	PKB	270	Government Marine Dept.	600 spk.

DUTCH GUIANA
(See under Dutch
West Indies)**DUTCH WEST
INDIES**
CURACAO

Aruba	12° 31' 05" N. 70° 02' 01" W.	PJA	108	Government	600 spk.
Bonaire	12° 09' 20" N. 68° 16' 15" W.	PJB	108	Government	600 spk.
Curaçao	12° 06' 19" N. 68° 56' 55" W.	PJC	400	Government	300, 600, 1,800 spk.
ST. MARTIN					
St. Martin	18° 01' 04" N. 63° 04' 19" W.	PJD	650	Government	300, 600, 900, 1,200, 1,500 1,800, 2,400 spk.

DUTCH GUIANA
Moengo

Moengo	05° 37' 50" N. 54° 24' 50" W.	PJO	80	—	300, 450, 600 spk.
Paramaribo Radio ..	05° 49' 48" N. 55° 12' 13" W.	PJN	300	Surinam Bauxite Co.	600, 800, 1,200 1,600, 1,800 spk.

ECUADOR

Esmeraldas	00° 58' 45" N. 79° 42' 00" W.	HCE	500	Government	300, 600, 1,700 spk.
Guayaquil	02° 12' 00" S. 79° 50' 00" W.	HCG	900	Government	300, 600, 2,500 3,200 spk.
Puná Guayas (T) ..	02° 45' 00" S. 79° 53' 00" W.	HCP	100	Government	600 c.w.
Quito	00° 13' 00" S. 78° 32' 00" W.	HCQ	900	Government	600, 2,500 3,200 spk.
Machala	03° 18' 00" S. 79° 55' 00" W.	HCM	300	Government	300, 600, 1700

EGYPT					
Abu Zabal Radio ..	30° 16' 09" N. 31° 22' 10" E.	SUC	2,500	Government	11,000 c.w.
Alexandria Radio ..	31° 11' 53" N. 29° 51' 45" E.	SUH	450	Egyptian State Tele- graphs	300, 600, 800, 1,000, 1,200 spk. 600 spk. 2,400 c.w.
SUDAN					
Khartoum	15° 37' 15" N. 32° 32' 00" E.	SUL	200 1,500 1,500	Government	1,300-3,700, 3,000 c.w.
Port Sudan Radio ..	19° 36' 35" N. 37° 13' 00" E.	SUD	350-450 1,000	Government	300, 600, 800 spk. 2,400, 2,800 c.w.
Akobo	7° 46' 30" N. 33° 00' 45" E.	AKR	150	Government	700 spk.
Atbara	17° 41' 15" N. 33° 58' 43" E.	ATR	150	Government	300, 600 spk.
Fasher (El)	13° 37' 33" N. 23° 21' 11" E.	FSR	300 800	Government	900 spk. 2,800 c.w.
Gambela	8° 14' 45" N. 34° 35' 30" E.	GMR	300	Government	700 spk.
Geneina	13° 26' 00" N. 22° 27' 00" E.	GNR	300 800	Government	900 spk. 2,800 c.w.
Malakal	09° 33' 00" N. 31° 39' 00" E.	MLR	300	Government	700 spk.
Mongalla	05° 11' 34" N. 31° 45' 56" E.	MGR	300	Government	700 spk.
Nasser	08° 35' 30" N. 33° 03' 30" E.	NSR	300	Government	900, 700 spk.
Nyala	12° 03' 03" N. 24° 53' 01" E.	NYR	300 800	Government	900 spk. 2,800 c.w.
Wau	7° 41' 58" N. 28° 00' 36" E.	WWR	250-300	Government	700 spk.
ERITREA					
Assab Radio	12° 59' 40" N. 42° 44' 00" E.	ICY	160	Italian Government ..	300, 600 spk.
Massaua Radio, ICX	15° 37' 24" N. 39° 28' 41" E.	ICX	1,600	Italian Government ..	3,500 (T), 4,000 9,400 (T) c.w.
Massaua Radio, IRG	15° 36' 30" N. 39° 28' 59" E.	IRG	270	Italian Government ..	300, 600, 1,200 spk.
Mersa Fatma	14° 14' 00" N. 40° 18' 00" E.	IRT	100	Italian Government ..	600 spk.
ESTHONIA					
Haapsalu	58° 57' 00" N. 23° 32' 00" E.	AZI	1,900	Government	2,500, 3,500, 3,600, 4,000, 5,000, 6,000, 8,000, 10,000 c.w.
Narva	59° 23' 00" N. 28° 13' 00" E.	AZN	100	Government	900 spk.
Nekmangrund Light- ship	59° 05' 00" N. 22° 13' 00" E.	AZQ	500	Government	200, 600, 1,500 spk.
Reserve Lightship ..	—	AZX	50	Government	300, 450, 600 spk.
Revalstein Lightship	59° 44' 00" N. 24° 44' 00" E.	AZR	50	Government	300, 450, 600 spk.
Saritchev Lightship..	58° 16' 00" N. 21° 12' 00" E.	AZS	30	Government	200, 600, 1,500 spk.
Tallinn, Revel	59° 26' 00" N. 24° 47' 00" E.	AZA	250 400	Government	300, 600, 1,200 spk. 600, 1,200 1,900 (W) spk.
Tartu	58° 22' 00" N. 26° 43' 00" E.	AZU	200	Government	1,000 spk.
FALKLAND ISLANDS					
Falkland Islands (Port Stanley)	51° 41' 15" S. 57° 49' 50" W.	VPC	650	Br. Admiralty	300, 600 spk.
Fox Bay	51° 56' 30" S. 60° 02' 40" W.	VQZ	80-100	Government	600 spk.
FAROE ISLANDS. (See under Den- mark)					
FERNANDO PO. (See under Spain)					

FIJI ISLANDS					
Lambasa	16° 26' 05" S. 170° 24' 33" E.	VPE	300	Government	300, 600 spk.
Savu-Savu	16° 46' 30" S. 170° 21' 30" E.	VQL	120	Government	600 spk
Suva	18° 08' 43" S. 178° 27' 56" E.	VPD	300	Government	300, 600 (W) 1,200 (FX) spk
Taveuni	16° 47' 46" S. 179° 59' 44" W.	VPF	200	Government	300, 600 spk.
FINLAND					
Abo	60° 25' 38" N. 22° 14' 15" E.	OJE	200	Government	1,200 spk.
Hangö	59° 50' 18" N. 22° 56' 40" E.	OJD	200	Government	300, 600 spk.
Helsingfors (Sandhamn)	60° 03' 24" N. 25° 03' 07" E.	OJA	1,000	Government	600, 5,200 (Pr. Nav.) 2,000, 5,200 (W) c.w.
Kotka	60° 27' 16" N. 26° 57' 04" E.	OJC	200	Government	600, 1,200 spk.
Waasa	63° 05' 10" N. 21° 37' 00" E.	OJG	200	Government	600, 1,200 spk.
Wiborg	60° 42' 55" N. 28° 45' 00" E.	OJB	200	Government	300, 600 spk.
FRANCE AND ALGERIA					
Abbeville Aerodrome (T.)	50° 08' 14" N. 01° 50' 31.5" E.	FNI Abbeville	100 120 300	Government (Aero- nautical Dept.)	600 i.c.w. 900 c.w. & t'py. 1,400, 1,680 (W) c.w.
Agde D.F.	43° 17' 17" N. 03° 31' 20" E.	FEC	120	Government (P. & T.)	450, 500, 800 spk.
Ajaccio Hydraviation (T.), Corsica	41° 55' 37" N. 08° 44' 26" E.	FNJ Ajaccio	40 100 200 350 300	Government (Aero- nautical Dept.)	900 t'py. 1,400 c.w. 1,825 t'py. 1,825 (W) c.w. 600 spk and c.w.
Ajaccio-Aspretto .. Corsica	41° 55' 31" N. 08° 45' 36" E.	FUI	300	—	—
Algiers T.S.F. ..	36° 45' 00" N. 03° 11' 00" E.	FFA	450	State Telegraphs ..	300, 600 spk.
Algiers Aerodrome FNA (T.)	36° 41' 53" N. 3° 13' 57" E.	FNA Alger	—	Government (Aero- nautical Dept.)	600 t'py., 900 c.w. & t'py. 1,400 c.w.
Algiers Aerodrome FOA (T.)	36° 34' 04" N. 3° 09' 02" E.	FOA Alger	—	Government (Aero- nautical Dept.)	600 t'py. 900 c.w. & t'py. 1,400 c.w.
Algiers-Baraki D.F.	36° 42' 00" N. 3° 07' 30" E.	FUJ	80	—	600-800 spk.
Angoulema ³	—	—	150	Government (Aero- nautical Dept.	—
Antibes	43° 35' 00" N. 07° 08' 00" E.	Antibes	—	—	900, 1,400, 1,680
Antibes Hydraviation (T)	43° 35' 03" N. 07° 07' 40" E.	FNK Antibes	100 120 400 150	Government (Aero- nautical Dept.)	600 c.w., 900 c.w. & t'py. 1,400 c.w. 1,825 (W) c.w.
Aubagne	43° 16' 30" N. 05° 36' 00" E.	FUG	150	Navy	—
Beauvais Aerodrome (T)	49° 26' N. approx. 02° 05' E. "	—	—	Government (Aero- nautical Dept.	900 t'py. & c.w. 1,400 c.w. 1,680 c.w.
Bernières D.F. ³ ..	49° 20' 00" N. 00° 25' 00" W.	FEB	120	State Telegraphs ..	450, 600, 800 spk.
Berre-Bouches-du- Rhône	43° 28' 55" N. 05° 10' 45" E.	FED	—	Navy	—
Biarritz Aerodrome (T)	43° 28' N. approx. 01° 34' W. "	FNV Biarritz	—	Government (Aero- nautical Dept.	600 c.w. 900 c.w. & t'py. 1,400 c.w. 1,525 c.w. 300, 600 spk.
Bonifacio T.S.F. Corsica	41° 23' 15" N. 09° 12' 00" E.	FFC	350	Government (P. & T.)	1,400, 1,525 (W) c.w.
Bordeaux Aerodrome	44° 50' 41.5" N. 00° 42' 43.5" W.	FNX	120	Government (Aero- nautical Dept.)	18,900, 19,800 (W) (Pr.) (Alt.)
Bordeaux (Croix d'Hins), Lafayette T.S.F.	—	LY	6,500	Government (P. & T.)	—
Bordeaux T.S.F. ..	44° 52' 21" N. 00° 37' 12" W..	FFX	250	Government ² (P. & T.)	300, 600 spk

FRANCE AND
ALGERIA—*contd.*

Boulogne-sur-Mer, T.S.F.	50° 43' 00" N. 01° 37' 00" E.	FFB	250	Government (P. & T.)	300, 600 spk.
Bourget Aerodrome (Le) (T)	48° 57' 23.5" N. 02° 26' 36.5" E.	FNB	220 450	Government (Aero- nautical Dept.)	900 c.w. & t'py. 1,400, 1,425, 1,680 (W) c.w. 900 c.w. & t'py.
Bourget Aerodrome (Le) (T)	49° 02' 50.5" N. 02° 30' 20.5" E.	FNB Le Bourget	300 450	Government (Aero- nautical Dept.)	1,400, 1,600 (Cal.) c.w.
Brest Aviation	48° 23' N. approx. 04° 30' W.	FUU	—	—	—
Cape Griz Nez Lighthouse	50° 52' 10" N. 1° 35' 04" E.	—	—	—	1,000 (Bea.) c.w.
Cherbourg Aviation	—	FUP	—	—	—
Cherbourg D.F.	49° 36' 32" N. 01° 36' 00" W.	FUC	200	State Telegraphs	450, 600, 800
Cherbourg-Rouges- Terres	49° 36' 32" N. 01° 36' 00" W.	FUC	300 400	Navy	300, 450, 600 (W), 800 spk. 2,250-2,400 c.w. 3,300 (W) 450, 600 spk.
Cuers-Pierrefeu	43° 14' 40" N. 06° 06' 50" E.	FUO	150	—	—
Dieppe	49° 55' 30" N. 01° 04' 30" E.	FFI	150	State Railway Admini- stration	400 spk.
Dijon Aerodrome	47° 16' 06.5" N. 05° 05' 18.5" E.	FND Dijon	120 250 450	Government (Aero- nautical Dept.)	900 c.w. & t'py. 1,350 (W) c.w. 1,400 c.w.
Djidjelli D.F. (Algeria)	36° 49' 10" N. 05° 46' 12" E.	FEJ	200	Navy	450, 600, 800 spk.
Dunkerque-Castelneau	51° 00' 30" N. 02° 23' 15" E.	FUD	800	Navy	450, 600, 800 spk. & c.w.
Eiffel Tower (Paris) (T)	48° 51' 30" N. 02° 17' 44" E.	FL	1,600	War Ministry	2,600 (T) (Pr) spk. & t'py. 10,000 c.w. alt. 115 (W), 3,200, 5,000 (Cal.), 7,000 (Cal.) 7,300 (W), 8,000 c.w. valve 800, 1,400, 1,525, 1,830
French Aerodromes (General Call)	—	FNZ	—	—	—
Guipavas D.F.	48° 27' 00" N. 04° 26' 00" W.	FEG	—	Navy	450, 600, 800 spk.
Havre T.S.F.	49° 31' 30" N. 00° 07' 00" E.	FFH	250	Government (P. & T.)	300, 600 spk.
Havre Abeilles (Le)	49° 28' 50" N. 0° 06' 07" E.	FUW	50	Cie de Remorquage & Sauvetage	300, 450, 600 spk.
Havre Aerodrome (Le) (T)	—	FNH Le Havre	—	—	600 c.w. 900 c.w. & t'py. 1,400, 1,680 c.w. 720 spk. 600 (Rec.)
Havre-Port (Le)	49° 28' 50" N. 0° 06' 07" E.	FUZ	50	—	—
Hourtin	45° 13' 08" N. 01° 07' 10" W.	FUH	—	Navy	—
Lorient Aviation	—	FEE	—	—	—
Lorient D.F.	47° 44' 00" N. 03° 21' 00" W.	FUN	300	Navy	450, 600, 800
Lorient-Pen-Mané	47° 44' 00" N. 03° 21' 00" W.	FUN	300 spk. 400 c.w.	Navy	300, 450, 600, 800 spk. & c.w.
Lyon Aerodrome	45° 43' 48.5" N. 04° 56' 24" E.	FNL Lyon	120 250 450	Government (Aero- nautical Dept.)	900 c.w. & t'py. 1,350 (W) c.w. 1,400 c.w.
Lyon T.S.F. (T)	La Doua, near Lyons	YN	—	Government (P. & T.)	15,300 (T, Cal., Pr.) t'py. & c.w. 600 c.w.
Marignane Aerodrome (T)	43° 26' 32" N. 05° 12' 35" E.	FNM	100 120 120-450	Government (Aero- nautical Dept.)	900 c.w. & t'py. 1,400, 1,525 (W) c.w. 600 c.w.
Marignane Aerodrome (T)	43° 23' 42" N. 5° 14' 18" E.	FOM	—	Government (Aero- nautical Dept.)	900 c.w. t'py. 1,400, 1,525 c.w. & t'py.
Marseille T.S.F.	43° 19' 00" N. 05° 21' 00" E.	FFM	250	Government	300, 600 spk.
Mengam	48° 20' 52" N. 04° 35' 20" W.	FUE	800	Navy	600, 800 spk.
Mitre D.F. (La)	43° 06' 13" N. 05° 55' 53" E.	FEM	—	Navy	2,100, 2,400 c.w. 450, 600, 800

FRANCE AND
ALGERIA—*contd.*

Montebourg Aero-station	49° 29' N. approx. 01° 23' W.	FUM	—	—	—
Montelimar Aerodrome	44° 34' 54" N. 04° 44' 00" E.	FNQ	100	Government (Aero-nautical Dept.)	1,400, 1,825 (W) c.w.
Moulin du Seigneur D.F.	48° 19' 36" N. 04° 33' 14" W.	FEI	—	Navy	450, 600, 800
Moulins ³ ..	—	—	150	Government Aero-nautical Dept.)	—
Mulhouse Aerodrome (T)	—	Mulhouse	—	Government (Aero-nautical Dept.)	900 c.w. & t'py. 1,400 c.w.
Nancy Aerodrome ..	48° 39' 05" N. 06° 09' 06" E.	FNC	120	Government (Aero-nautical Dept.)	900 c.w. & t'py. 1,400 c.w.
Nantes ³	—	—	300	Government (Aero-nautical Dept.)	1,550 (W) c.w.
Nantes-Basse-Lande	47° 10' 40" N. 01° 42' 00" W.	UA	1,500	Navy	2,800 spk. (W) 9,000 c.w.
Nice T.S.F. ..	43° 39' 00" N. 07° 10' 00" E.	FFN	200	Government P. & T.)	300, 600 spk.
Nîmes Aerodrome ..	43° 51' 29" N. 04° 24' 25.5" E.	FNN	100	Government (Aero-nautical Dept.)	1,400, 1,825 (W), c.w.
Niou-Huella D.F. (Ushant)	48° 27' 40" N. 5° 06' 50" W.	FEU	—	Navy ..	600 (Ret.)
Oran-Aïn-el-Turck (Algeria)	35° 45' 00" N. 00° 45' 30" W.	FUK	600	Navy	300, 450, 600 ((W) 800, 3,300 (W) spk. & c.w.
Oran Aerodrome (T)	—	FEK	—	Army	—
Oran Aerodrome (T) (Algeria)	35° 38' 06.5" N. 00° 39' 29" W.	FOO	250	Government (Aero-nautical Dept.)	600 t'py. 900 c.w. & t'py. 1,400 (W) c.w.
Oran-la-Senia Aero-station	35° 42' N. approx. 0° 30' W. approx.	FEK	—	Government (Aero-nautical Dept.)	—
Orly Aerodrome (T)	48° 39' 40" N. 2° 22' 08" E.	FOO	—	Government (Aero-nautical Dept.)	600 c.w. 900 c.w. & t'py. 1,400 c.w.
Palyvestre Avittion	Hyerès	FEF	—	Government (Aero-nautical Dept.)	900-1,400
Penmarch D.F. ..	47° 48' 30" N. 04° 21' 01" W.	FEP	120	Navy	450, 600, 800 spk.
Perpignan Aerodrome	42° 44' 31.5" N. 02° 52' 13" E.	FNP	120	Government (Aero-nautical Dept.)	900 c.w. & t'py. 1,400 c.w.
Pointe Du Raz D.F.	48° 02' 23" N. 04° 44' 00" W.	FER	120	Navy	1,525 (W) c.w. 450, 600, 800 spk.
Pontarlier Aerodrome (T)	46° 54' N. approx. 06° 20' E.	Pontarlier	—	Government (Aero-nautical Dept.)	900 c.w. & t'py. 1,350, 1,400 c.w.
Porquerolles ..	42° 59' 00" N. 06° 12' 00" E.	FUQ	600	Navy	450, 600, 800, 1,350 spk. 3,300 c.w.
Rochefort-sur-Mer ..	45° 55' 30" N. 00° 57' 00" W.	FUR	400	Navy	300, 450, 600, 800 spk. & c.w.
Romilly Aerodrome	48° 30' 15.5" N. 03° 44' 56" E.	FNR	120	Government (Aero-nautical Dept.)	1,400, 1,680 (W) c.w.
Rouen Port	49° 26' 29" N. 01° 15' 16" E.	FUV	50	Chambre de Commerce de Rouen	Trans. 720 spk. Listening 600
Sainte Assise ..	48° 32' N. approx. 02° 32' E. "	UFP	400	—	2,300 valve
		UFQ	1,600		9,250 altr.
		UFR	1,600		9,750 altr.
		UFS	400	Cie. Radio-France ..	3,200 altr.
		UFT	6,250		19,300 altr.
		UFU	6,500		19,700 altr.
S. Cyr Aerostation ..	48° 48' N. approx. 02° 02' E.	FUZ	—	Army	900 c.w.
S. Inglevert Aero-drome (T)	50° 52' 48" N. 1° 44' 30" E.	FNG	250	Army	600 t'py. 900 c.w. & t'py.
		S. Inglevert	450		1,400 (FX), 1,680 (W) c.w.
S. Maries de la Mer T.S.F.	43° 27' 00" N. 04° 26' 00" E.	FFS	450	Government (P. & T.)	300, 600, spk.
S. Nazaire D.F. ..	47° 15' 24" N. 02° 13' 49" W.	FEZ	120	Navy	450, 600, 800 spk.
S. Pierre des Corps ..	47° 23' 50" N. 00° 44' 02" E.	YG	—	War Ministry ..	5,900 arc. 10,000 altr.
S. Raphael ..	43° 25' 15" N. 06° 44' 07" E.	FUF	150	Navy	—
Sfax, Tunisia	34° 45' 06" N. 10° 46' 24" E.	FUS	—	—	450

**FRANCE AND
ALGERIA—contd.**

Soubise D.F. ..	45° 56' 21" N. 00° 59' 13" W.	FES	120	Navy	450, 600, 800 spk.
Strasbourg Aerodrome (T)	48° 32' 37.5" N. 07° 37' 34.5" E.	FNS Strasbourg	120 250 t'py.	Army	900 c.w. & t'py. 1,400 (FX)
Toulon-Mourillon ..	42° 06' 50" N. 05° 56' 07" E.	FUT	450 800 spk.	Navy	1,720 (W) c.w.
Toulouse Aerodrome (1) (T)	43° 32' 44" N. 01° 22' 29.5" E.	FNT Toulouse	1,200 c.w. 100 250 t'py.	Army	600, 1,350, 5,000 spk. & c.w. 900 c.w. & t'py. 1,400 (FX) c.w. & t'py.
Toulouse Aerodrome (2) (T)	—	FOT Toulouse	450 —	Army	1,525 (W) c.w. 900 c.w. & t'py. 1,400, (FX)
Tours Aerodrome*	—	—	—	Army	1,525 c.w. —
Tréguier-St.-Gonery D.F.	48° 50' 13" N. 03° 13' 56" W.	FET	120	State Telegraphs ..	450, 600, 800 spk.
Trinité (La) D.F. ..	48° 21' 53" N. 04° 35' 18" W.	FEX	—	Navy	2,100
Ushant T.S.F. ..	48° 27' 05" N. 05° 05' 00" W.	FFU	450	Government	300, 600 spk.
Valenciennes Aero- drome (T)	50° 20' 35" N. 03° 31' 23" E.	FNV Valen- ciennes	120 250 t'py. 450	Army	900 c.w. & t'py. 1,400 (FX) 1,680 (W) c.w.

**FRENCH
EQUATORIAL
AFRICA**

Pointe-Noire, Congo	04° 46' 49" S. 11° 43' 02" E.	HZL	Day 275 Night 550	Government	300, 600, 1,800 spk.
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FRENCH GUIANA

Cayenne	04° 56' 30" N. 52° 19' 30" W.	HYW	500	Cie Gen. de T.S.F. ..	600, 1,500 spk 8,000 c.w.
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**FRENCH INDO-
CHINA**

Cac-Ba (D.F.) ..	20° 44' 00" N. 107° 02' 05" E.	HVC	80	Government	300, 600 spk.
Fort Bayard ..	21° 13' 00" N. 110° 23' 00" E.	HVH	250	Government	1,800, 2,400 spk.
Hanoi	21° 03' 49" N. 105° 54' 18" E.	HVA	1,000	Government	300, 600 (W), 1,800 2,400, 3,000 spk.
Kien-An (D.F.) ..	20° 47' 00" N. 106° 37' 00" E.	HVB	150	Government	600, 1,800 (T.W) spk.
Moncay	21° 31' 00" N. 107° 58' 00" E.	HVD	150	Government	600, 1,800 spk.
My-Tho	10° 21' 45" N. 10° 21' 45" E.	HVM	250	Government	600 (W), 2,000 spk.
Phu-Quoc	10° 18' 00" N. 103° 58' 00" E.	HVP	200	Government	600 (W), 2,000 spk.
Poulo-Condore ..	08° 40' 00" N. 106° 41' 00" E.	HVO	100	Government	600 (W), 2,000 spk.
Saigon Phu-Tho ..	10° 47' 00" N. 106° 42' 00" E.	HZA	6,250 6,500	Cie Gen. de T.S.F. ..	15,750, 20,800 (T) c.w.
Tourane	16° 04' 05" N. 108° 13' 05" E.	HVI	250	Government	300, 600 (W) 1,800 spk.

**FRENCH SETTLE-
MENTS IN
OCEANIA**

Makatea	15° 50' 00" S. 148° 11' 00" W.	HVY	Day 400 Night 600	Cie des Phosphates ..	300, 600 spk.
Papeete Ile Tahiti ..	17° 30' 15" S. 149° 29' 15" W.	HVX	Day 1,000 Ngt. 2,000	Government	600 2,000 (W) spk.

**FRENCH SOMALI
COAST**

Djibouti	11° 35' 15" N. 43° 07' 20" E.	HZE	350	Administration of the Colony	600 spk
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**FRENCH WEST
AFRICA and
THE SAHARA**

Bamako	12° 35' 00" N. 7° 53' 00" W.	HWL	3,000	French Government ..	11,400 altr.
Conakry (Guinea)	09° 30' 50" N. 13° 42' 46" W.	HWD	400	Government	300, 600, 2,000 spk.
Cotonou (Dahomey)	06° 20' 46" N. 02° 28' 48" E.	HWH	300	Government	300, 600 spk.
Dakar (Senegal)	14° 40' 27" N. 17° 25' 22" W.	HWB	600	Government	300, 600 spk.
Grand-Bassam .. (Ivory Coast)	05° 11' 00" N. 03° 43' 00" W.	HWG	300	Government	600 spk.
Port Etienne ..	20° 55' 39" N. 17° 03' 01" W.	HWI	400	Government	300, 600, 2,000 spk.
Rufisque (Senegal)	14° 43' 04" N. 17° 16' 23" W.	HWC	500	Government	300, 600, 2,000 spk.
Tabou (Ivory Coast)	04° 25' 19" N. 07° 22' 27" W.	HWF	300	Government	450, 600, 80 spk.

FRIENDLY ISLANDS
(See under Pa.ia:
Islands)**GAMBIA**

Basse Gambia ..	13° 18' 54" N. 14° 13' 00" W.	VSX	250	Government	900 c.w.
Bathurst	13° 27' 16" N. 16° 34' 19" W.	VSH	150	Government	300, 600, 900 spk.
Georgetown, Gambia (T)	13° 31' 00" N. 14° 16' 00" W.	VSX	250	Government	900 c.w.

GERMANY

(See note C)

Adlergrund Lightship Baltic Sea	54° 50' 12" N. 14° 22' 06" E.	KAG	Day 100 Night 150	Government (P. & T.)	300, 600 spk.
Amrum Bank Light- ship, North-Sea	54° 33' 12" N. 07° 53' 12" E.	KAF	Day 120 Night 210	Government (P. & T.)	300, 450, 600 spk.
Arngast Lighthouse, Jade Bay	53° 28' 58" N. 08° 11' 06" E.	KAT	—	Government (P. & T.)	450 spk.
Ausseneider Lightship North Sea	54° 14' 00" N. 8° 18' 18" E.	KAJ	Day 30 Night 50	Government (P. & T.)	300, 600 spk.
Aussenjade Lightship North Sea	53° 51' 34" N. 07° 56' 45" E.	KAU	60	Government (P. & T.)	300, 450 spk.
Borkum D.F. ..	53° 35' 48" N. 06° 40' 12" E.	KBM	—	Government (P. & T.)	450, 600, 800 (DF) spk. & c.w.
Borkum	53° 34' 51" N. 06° 41' 42" E.	KBO	—	Government (P. & T.)	450, 600, 800 (DF Rec. only)
Borkum Riff Light- ship	53° 45' 05" N. 06° 04' 05" E.	KBR	Day 90 Night 120	Government (P. & T.)	300, 600 spk. 950, 1,000 (Bea) c.w.
Bremerhaven Lloyd- halle	53° 33' 04" N. 08° 33' 08" E.	KBH	80	Norddeutscher Lloyd	600 spk.
Cologne	—	GEK	—	British Government	900, 1,680
Cuxhaven	53° 52' 24" N. 08° 42' 43" E.	KBX	Day 325 Night 650	Government (P. & T.)	300, 600 spk.
Cuxhaven	53° 52' 00" N. 08° 43' 00" E.	KCX	—	—	600 spk.
Eidergaliote Lightship	54° 13' 46" N. 08° 35' 36" E.	KBL	Day 90 Night 160	Government	300, 450, 600 spk.
Eilvese, Hanover	52° 32' 00" N. 09° 25' 00" E.	OUI	5,400	Transradio A.G. ..	9,700, 14,600 c.w. alt.
Elbe Lightship ..	54° 00' 03" N. 08° 15' 00" E.	KBF	60	Government (P. & T.)	600 spk.
Fehmarnbelt Light- ship	54° 36' 02" N. 11° 09' 23" E.	KBC	Day 100 Night 180	Government (P. & T.)	300, 450, 600 spk.
Heligoland	54° 11' 01" N. 07° 53' 33" E.	KAH	100	Government (P. & T.)	300, 600 spk.
Kalkgrund Lightship	54° 49' 54" N. 09° 53' 18" E.	KBD	Day 90 Night 160	Government (P. & T.)	300, 450, 600 spk.
Kiel Lightship	54° 29' 00" N. 10° 16' 18" E.	KBI	Day 40 Night 70	Government (P. & T.)	300, 450, 600 spk.
Kiel-Freidrichsort ..	54° 23' 38" N. 10° 11' 26" E.	KBK	220	Government	300, 450, 600 (W) 1,650 (W)
Königsberg	54° 43' N. approx. 20° 30' E. approx.	KÖ	—	—	spk. & c.w. 2,450 (W) c.w.

GERMANY—contd.

Königs Wusterhausen (T), Berlin	52° 18' 19" N. 13° 37' 22" E.	LP	2,000	State Electr. Adm. ..	1,850, 2,450 2,800, 3,350 (W) 4,000, 5,200 5,500 valve. 3,150, 5,700, 7,450 altr., 8,100 arc.
List	55° 01' 20" N. 08° 26' 30" E.	KAL	—	Government (P. & T.)	600, 800 (DF) spk. & c.w.
List D.F. .. .	55° 00' 12" N. 08° 23' 12" E.	KAO	—	Government (P. & T.)	450, 600, 800 (DF rec. only)
Nauen	52° 39' 00" N. 12° 55' 00" E.	POZ	6,500	—	3,100 (T) spk. 4,900, 5,600, 6,500, 7,800, 8,700, 9,800, 12,300, 13,000 18,075 (T) altr.
Neumünster Lightship	54° 05' 40" N. 09° 57' 40" E.	KAR	—	—	—
Norddeich (T.) ..	53° 36' 26" N. 07° 08' 32" E.	KAV	Day 420 Night 830 Day 1,500 Night 3,000	Government (P. & T.)	600, 1,100 (W) spk. 1,800 (W) 2,100 2,300, 2,400, 3,000 c.w.
Norderney Lightship	53° 55' 39" N. 7° 13' 58" E.	KAI	Day 75 Night 100	Government	300, 450, 600 spk.
Nordholz D.F. ..	53° 46' 51" N. 08° 38' 42" E.	KBN	—	Government (P. & T.)	600, 800 (DF) spk. & c.w.
Nordholz	53° 47' 06" N. 08° 38' 27" E.	KBQ	—	Government (P. & T.)	450, 600, 800 (DF Rec. only)
Pillau	54° 38' 42" N. 19° 53' 27" E.	KAP	—	Government (P. & T.)	600 (W) spk. 1,650 (W) c.w.
Riehl	50° 58' 00" N. 06° 58' 00" E.	GGC	500	British Government ..	2,050 c.w.
Sassnitz	54° 30' 50" N. 13° 38' 35" E.	KBV	110	Government (P. & T.)	600 spk.
Stralsund	54° 18' 42" N. 13° 06' 06" E.	KBU	—	—	—
Swinemünde (T) ..	53° 54' 55" N. 14° 16' 15" E.	KAW	Day 330 Night 660	Government (P. & T.)	300, 600 (W), 1,100 (W) spk. 1,800 (W) t'py. (DF Rec. only)
Warnemünde D.F.	54° 10' 39" N. 12° 00' 56" E.	KBY	—	Government (P. & T.)	—
Weser Lightship ..	53° 54' 18" N. 07° 49' 30" E.	KBW	80	Government (P. & T.)	300 spk.
Wilhelmshaven ..	53° 31' 16" N. 08° 09' 33" E.	KAN	—	Government (P. & T.)	450 spk. & c.w.

GIBRALTAR

Gibraltar, North Front	36° 08' 32" N. 05° 20' 29" W.	BWW	—	British Admiralty ..	3,900 (W) c.w.
Gibraltar Rock ..	36° 06' 21" N. 05° 20' 54" W.	BYW	500	British Admiralty ..	600 s.p.k.

**GILBERT and
ELLICE ISLANDS**
(See under Pacific
Islands)**GOLD COAST**

Accra.. .. .	05° 32' 23 94" N. 40° 12' 13 74" W.	VPG	250	Government	300, 600 spk.
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**GREAT BRITAIN
AND NORTHERN
IRELAND**

(See note D)

Aberdeen	57° 11' 29 9" N. 02° 11' 13" W.	BYD	—	Admiralty	—
Aberdeen 2 BD ..	—	2 BD	—	British Broadcasting Company	495 t'py.
Admiralty	51° 30' 00" N. 00° 10' 06" W.	BYA	—	Admiralty	—
Air Ministry, London	51° 27' 50" N. 00° 01' 35" E.	GFA	500, 1,200	British Air Force ..	900 (Cal.), 1,400 (W), (Cal.) 1,680 (W), (Cal.) 4,100 (W) c.w.

**GREAT BRITAIN
AND NORTHERN
IRELAND—*con. a.***

Aldershot	51° 15' 55" N. 06° 45' 25" W.	GGB	1,000	—	1,900 c.w.
Andover	51° 12' 30" N. 01° 32' 30" W.	GFI	—	British Air Force	—
Ballycastle Radio (Antrim)	55° 11' 00" N. 06° 12' 00" W.	GSL	15	Post Office	250 spk.
Belfast 2 BE	—	2 BE	—	British Broadcasting Company	435 t'py.
Berwick	55° 41' 46.7" N. 01° 53' 41.7" W.	BVG	—	Post Office	450 spk.
Bircham Newton ..	52° 52' 30" N. 00° 39' 45" E.	GFN	—	British Air Force ..	c.w.
Birmingham 5 IT ..	—	5 IT	—	British Broadcasting Company	475 t'py.
Bournemouth 6 BM	—	6 BM	—	British Broadcasting Company	385 t'py.
Bradford 2 LS	—	2 LS	—	British Broadcasting Company	310 t'py.
Caister-on-Sea Radio	52° 38' 47" N. 01° 43' 51" E.	GCS	—	Post Office	1,000
Calshot	50° 49' 10" N. 01° 18' 30" W.	GFL	—	British Air Force ..	—
Cardiff, 5 WA	—	5 WA	—	British Broadcasting Company	351 t'py.
Carnarvon Radio ..	53° 07' 00" N. 04° 11' 00" W.	MUU GLC	— —	Marconi Company ..	14,200 c.w. 9,500 c.w.
Caroline (Belfast) ..	54° 36' 00" N. 5° 55' 00" W.	BVI	—	Navy	—
Castle Bromwich Radio (T)	52° 31' 00" N. 01° 47' 40" W.	GEC Castle Bromwich	400 Mrse. 100 Tpny.	British Air Force ..	900, 1,300 c.w. 900 t'py.
Cattewater	50° 20' 45" N. 04° 07' 00" W.	GFM	—	British Air Force ..	—
Chatham, Admiralty House	—	BXC	50	Admiralty	310 spk.
Chatham, H.M.S. Hecla	—	BXM	250	Admiralty	310 spk.
Chelmsford	51° 43' 45" N. 00° 28' 38" E.	MZX	—	Marconi Company ..	3,800
Cleethorpes Radio ..	53° 31' 44.4" N. 00° 03' 17.6" W.	BYB	1,000	Admiralty	3,000 spk. 3,000-8,000 4,500 c.w.
Cranwell	53° 02' 05" N. 00° 29' 50" W.	GFC	—	British Air Force ..	—
Croydon Radio (T) DF	51° 21' 10" N. 00° 07' 40" W.	GED Croydon	400 Mrse. 150 Tpny.	Civil Aviation ..	900, c.w. 900 t'py.
Cullercoats Radio DF	55° 02' 15.6 N. 01° 25' 41.5" W.	GCC	250	Post Office	300, 600 (W) spk.
Culver Cliff	50° 39' 58.4" N. 01° 06' 07.8" W.	BYM	200	Admiralty	—
Devizes Radio	51° 23' 49.7" N. 01° 57' 10.7" W.	GKU	1,000	Post Office	1,800 2,100 (Cal.) 3,000 c.w.
Didsbury Radio (T)	53° 26' 15" N. 02° 15' 30" W.	GEM Didsbury	400 Mrse. 100 Tpny.	British Air Force ..	900, 1,300, c.w 900 t'py.
Dolphin, Fort Block- house, Portsmouth	50° 47' 00" N. 01° 07' 00" W.	BXO	—	Navy	—
Donibrisue	56° 02' 35" N. 03° 21' 05" W.	GFK	250	British Air Force ..	1,300 c.w.
Duxford	52° 05' 40" N. 00° 07' 45" E.	GFH	—	British Air Force ..	—
Edinburgh 2 EH	—	2 EH	—	British Broadcasting Company	328
Farnborough	51° 16' 55" N. 00° 45' 05" W.	GFQ	—	British Air Force ..	—
Felixstowe	51° 56' 28" N. 1° 19' 29" E.	GFS	—	—	1,300 c.w.
Fishguard Radio ..	52° 00' 44.5" N. 04° 59' 19.5" W.	GRL	200	Post Office	300, 600 spk.
Flamborough D.F. ..	54° 06' 49.7" N. 00° 04' 56.3" W.	BVN	—	Post Office	450
Flowerdown	51° 05' 15" N. 01° 20' 00" W.	GFR	—	British Air Force ..	—
Flying Fox, Bristol	51° 27' 00" N. 2° 37' 00" W.	BVE	—	Navy	—
Folkestone Harbour Radio	51° 04' 38" N. 01° 11' 27" E.	GUR	45	Southern Railway ..	300, 600 spk.

**GREAT BRITAIN
AND IRELAND—*contd.***

GEZ	Any Ground Station of the R.A.F.	GEZ	—	British Air Force ..	—
Glasgow 5 SC ..	—	5 SC	—	British Broadcasting Company.	420 t'py.
Gosport	50° 48' 00" N. 01° 09' 40" W.	GFP	—	British Air Force ..	—
Govan, Glasgow ..	55° 51' 40" N. 4° 19' 30" W.	BVC	—	Navy	—
Grimsby Radio ..	53° 35' 07" N. 00° 04' 05.7" W.	GKZ	100	Post Office	300, 600, spk.
Guernsey (T) ..	49° 26' 40" N. 02° 32' 15" W.	GEY Guernsey	400 Mrse. 100 T'pny.	British Air Force ..	900, 1,300, c.w. 900 t'py.
Helicon, S. Shields ..	54° 59' 30" N. 1° 26' 00" W.	BVA	—	Navy	—
Henlow	52° 00' 40" N. 00° 18' 00" W.	GFY	—	British Air Force ..	—
Heysham Harbour Radio	54° 02' 00" N. 02° 55' 00" W.	GKG	150	L.M. & S. Railway ..	800 spk.
Horsea	50° 50' 15" N. 01° 06' 10" W.	BYC	—	Admiralty	—
Hove	50° 52' 00" N. 0° 12' 00" W.	BVH	—	Navy	—
Hull 6 KH	—	6 KH	—	British Broadcasting Company	335 t'py.
Inchkeith	Firth of Forth 56° 01' 59" N. 3° 08' 04" W.	BZA	—	—	Experimental
Ipswich	52° 03' 18.8 N. 01° 08' 28.2" E.	BYE	—	Admiralty	2,400 c.w.
Irwell, Manchester ..	53° 29' 40" N. 2° 16' 00" W.	BVD	—	Navy	—
Isle of Grain	51° 27' 10" N. 00° 43' 15" E.	GFG	—	British Air Force ..	—
Isle of Man Radio ..	54° 09' 00" N. 04° 30' 00" W.	GDX	—	Post Office	—
Land's End Radio ..	50° 07' 03.8" N. 05° 40' 10" W.	GLD	250	Post Office	300, 600, (W) spk.
Lee-on-the-Solent ..	50° 48' 25" N. 01° 12' 25" W.	GFW	—	British Air Force ..	c.w.
Leeds 2 LS	—	2 LS	—	British Broadcasting Company	346 t'py.
Lerwick Radio ..	60° 08' 25" N. 01° 11' 00" W.	GEL	250	British Air Force ..	600, 900, 1 400 spk.
Leuchars	56° 22' 40" N. 02° 52' 15" W.	GFD	—	British Air Force ..	c.w.
Liverpool 6 LV ..	—	6 LV	—	British Broadcasting Company	315 t'py.
Lizard D.F.	49° 59' 06.3" N. 05° 12' 24.1" W.	BVY	—	Post Office	800 spk.
Loch Boisdale Radio	57° 08' 00" N. 07° 16' 00" W.	GCB	150	Post Office	300 spk.
London, 2 LO	—	2 LO	—	British Broadcasting Company	365 t'py.
Lympne Radio (T) ..	51° 04' 40" N. 01° 00' 50" E.	GEG Lympne	400 Morse 100 T'pny.	British Air Force ..	900, c.w. 900 t'py.
Malin Head Radio ..	N. r.h. of Ireland 55° 21' 45" N. 07° 20' 30" W.	GMH	250	Post Office	300, 600
Manchester 2 ZY ..	—	2 ZY	—	British Broadcasting Company	375 t'py.
Manchester	53° 26' 00" N. 02° 15' 00" W.	GEM	—	Air Ministry	900, 1,300
Netheravon	51° 14' 40" N. 01° 45' 45" W.	GFX	—	British Air Force ..	—
Newcastle 2 NO ..	—	2 NO	—	British Broadcasting Company	400 t'py.
Newhaven Radio ..	50° 47' 09" N. 00° 03' 30" E.	GNV	120	Southern Railway ..	300 spk.
Niton Radio & D.F.	50° 34' 41.8" N. 01° 17' 00" W.	GNI	150	Post Office	300, 600 spk.
North Foreland Radio	51° 22' 29" N. 01° 26' 51" E.	GNF	150	Post Office	300, 600 spk.

**GREAT BRITAIN
AND NORTHERN
IRELAND—*contd.***

Northolt Radio ..	51° 33' 05" N. 00° 21' 30" W.	GKB	—	Post Office	6,950 c.w.
North Ronaldshay, Orkney Islands	59° 22' 19" N. 2° 26' 05" W.	GKH	20	Post Office	250 spk.
Nottingham 5 NG ..	—	5 NG	—	British Broadcasting Company	322 t'py
Old Sarum	51° 06' 00" N. 01° 47' 10" W.	GFT	—	British Air Force ..	—
Ongar Radio	51° 42' 51" N. 00° 11' 18" E.	GLA GLB GLO GLP	—	Marconi Company ..	2,950 3,950 4,350 5,100 c.w.
Orfordness, D.F. ..	52° 05' 46" N. 01° 32' 56" E.	BXH	—	—	450 spk. (Experimental)
Oxford Radio	51° 49' 57.5" N. 01° 32' 47" W.	GBL	2,500	Post Office	8,750, 12,350 c.w.
Parkeston Quay Radio	51° 56' 58" N. 01° 15' 12" E.	GPQ	130	L. & N.E. Ry. ..	450, 600 spk.
Pembroke	51° 41' 30" N. 04° 57' 31.7" W.	BYF	—	Admiralty	—
Plymouth 5 PY ..	—	5 PY	—	British Broadcasting Company	335 t'py.
Poldhu Radio	50° 01' 44" N. 05° 15' 43.4" W.	MPD	—	Marconi Company ..	Experimental.
Portland Bill	50° 31' 13.8" N. 02° 27' 17.6" W.	BYN	—	Admiralty	600, 800
Portpatrick Radio ..	54° 50' 37.7" N. 05° 07' 23.8" W.	GPK	150	Post Office	300, 600 spk.
Portsmouth Signal School	50° 48' 00" N. 01° 06' 00" W.	BZC	—	Admiralty	—
President, London ..	51° 33' 00" N. 0° 06' 00" W.	BVF	—	Navy	—
Pulham Radio (T) DF	52° 24' 15" N. 01° 14' 25" E.	GEP Pulham	400 Morse 100 T'pny.	British Air Force ..	900, c.w. 900 t'py.
Rame Head	50° 18' 59.3" N. 04° 13' 0.9" W.	BYO	—	Admiralty	600, 800
Rathlin Island Radio	55° 17' 00" N. 06° 10' 00" W.	GRN	15	Post Office	250 spk.
Renfrew Radio (T) ..	55° 51' 55" N. 04° 23' 40" W.	GER	400 Morse	British Air Force ..	900 (W), 1,300 c.w., 900 t'py
R.N. College, Dartmouth	50° 21' 00" N. 3° 35' 00" W.	Renfrew BVJ	100 t'py. —	Navy	—
Rosyth	56° 01' 42" N. 03° 24' 43.9" W.	BYH	—	Admiralty	—
Sanday	59° 14' 14" N. 2° 36' 12" W.	GKJ	20	—	250 spk.
Satellite, N. Shields	55° 00' 30" N. 1° 26' 30" W.	BVB	—	Navy	—
Seaforth Radio	53° 28' 06.7" N. 03° 00' 42" W.	GLV	150	Post Office	300, 600 spk.
Sealand	53° 13' 25" N. 2° 59' 55" W.	GFO	—	British Air Force ..	—
Sheerness	51° 26' 45" N. 00° 44' 46" E.	BYK	—	Admiralty	—
Sheffield 6 FL ..	—	6 FL	—	British Broadcasting Company	301 t'py.
Spittlegate	52° 54' 00" N. 00° 36' 30" W.	GFS	—	British Air Force ..	—
Stoke-on-Trent, 6 ST	—	6 ST	—	British Broadcasting Company	306 t'py.
Stonehaven Radio ..	56° 56' 21.3" N. 02° 16' 49.2" W.	GSW	900	Post Office	4,600 c.w.
Swansea 5 SX	—	5 SX	—	British Broadcasting Company	—
Tobermory Radio ..	56° 37' 10" N. 06° 03' 30" W.	GCA	150	Post Office	300 spk.
Uxbridge	51° 32' 45" N. 00° 27' 35" W.	GFU	—	British Air Force ..	—
Wick Radio	58° 26' 16" N. 03° 05' 53.5" W.	GKR	150	Post Office	300, 600 spk

GREECE

(See note E)

Alexandroupolis ..	40° 49' 52" N. 25° 53' 54" E.	SXD	150	Government ..	300, 600 spk.
(D d agatch)					
Athens No. 1 ..	37° 58' 30" N. 23° 43' 13" E.	SXA	150	Navy ..	600, 1,200 spk.
Athens No. 2 ..	37° 58' 30" N. 23° 43' 13" E.	SXA	150	Navy ..	600 spk.
Athens Botanique	37° 59' 17" N.	SXG	400	Navy ..	3,600 (W, Pr), 4,400 spk.
No. 1	23° 41' 34" E.				
Athens Botanique,	37° 59' 17" N.	SXG	—	Navy ..	600, 900, 1,200 spk.
No. 2	23° 41' 34" E.				
Athens Radio ..	37° 49' 26" N. 23° 48' 40" E.	SXB	150	Navy ..	300, 600 spk.
Canea, Crete ..	35° 28' 05" N. 24° 01' 00" E.	SXN	350	Navy ..	300, 600
Chios ..	38° 20' 00" N. 26° 05' 30" E.	SXO	150	Navy ..	300, 600 spk.
Corfu No. 1 ..	39° 37' 11" N. 19° 54' 21" E.	SXK	—	Navy ..	2,000 spk.
Corfu No. 2 ..	39° 37' 11" N. 19° 54' 21" E.	SXK	—	Navy ..	3,500, 4,500, 5,800 c.w.
Corfu No. 3 ..	39° 37' 11" N. 19° 54' 21" E.	SXK	150	Navy ..	300, 600 spk.
Fassa, Andros ..	37° 57' 35" N. 24° 42' 35" E.	SXF	—	Navy ..	600 spk.
Isthmus of Corinth	37° 55' 05" N. 22° 59' 55" E.	SXI	70	Nouvelle Société de l'Isthme de Corinthe	300, 600 spk.
Poros ..	37° 30' 08" N. 23° 27' 40" E.	SXP	—	Navy ..	600 spk.
Salamis ..	37° 58' 11" N. 23° 32' 02" E.	SXL	—	Navy ..	600 spk.
Salonica ..	40° 35' 43" N. 22° 57' 56" E.	SXC	200	Navy ..	300, 600 spk.
Samos ..	37° 47' 00" N. 26° 40' 00" E.	SXM	—	Navy ..	600 spk.
GUADELOUPE					
Destrellan ..	16° 15' 11" N. 61° 34' 23" W.	HYU	400	Government ..	600, 800, 1,200, 1,500 spk.

GUAM (See under
Pacific Islands)**HAITI REPUBLIC**

Port au Prince ..	18° 33' 18" N. 72° 19' 52" W.	NSC	300-600	United States Navy	600, 952, 2,250 (W) 2,400, 3,750, 3,950 spk. & c.w.
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HAWAIIAN ISLANDS

Hilo KLN ..	19° 31' 26" N. 155° 20' 03" W.	KLN	150	Mutual Telephone Co.	300, 550, 600 c.w.
Hilo NPH ..	19° 44' 03" N. 155° 03' 09" W.	NPH	—	U.S. Navy ..	600, 952, 1,999 2,100, spk.
Honolulu KOG ..	21° 18' 12" N. 157° 50' 36" W.	KOG	200	Mutual Telephone Co.	300, 550, 600 c.w.
Honolulu KYB ..	21° 18' 00" N. 157° 51' 00" W.	KYB	75	Hawaiian Pineapple Co.	238 c.w.
Honolulu NPM ..	21° 26' 45" N. 157° 58' 00" W.	NPM	300-2,500	U.S. Navy ..	2 100, 2,653 3,950 6,379 spk. & c.w.
(Heela Point)					
Honolulu NPM	—	NPM	300-2,500	U.S. Navy ..	600, 952, 2,254 (WT), 3,950 11,490 (T), spk. & c.w.
(Pearl Harbour)					
Kahuku KGI ..	21° 42' 12" N. 157° 58' 33" W.	KGI	4,000	Radio Corp. of America	16,300 c.w.
Kahuku KIE ..	—	KIE	4,000	Radio Corp. of America	9,145, 16,975 spk. & c.w.
Kaumapalapau ..	20° 47' 00" N. 156° 59' 00" W.	KRQ	75	Hawaiian Pineapple Co.	288 c.w.
Kaunakakai ..	21° 05' 21" N. 157° 01' 29" W.	KHO	150	Mutual Telephone Co., Ltd.	300, 550, 600 spk.
Kawaihae ..	20° 02' 38" N. 155° 50' 05" W.	KHN	300	Mutual Telephone Co., Ltd.	300, 550, 600 spk.
Lihue ..	21° 57' 58" N. 159° 22' 16" W.	KHM	300	Mutual Telephone Co., Ltd.	300, 550, 600 spk.
Luke Field ..	Fords Island	WYQ	250	U.S. Army ..	1,500 c.w.
Wahiawa ..	21° 29' 28" N. 158° 02' 37" W.	KHK	300	Mutual Telephone Co.	300, 550, 600 2,350 spk. & c.w.
Wailuku ..	20° 55' 00" N. 156° 30' 00" W.	KHL	200	Mutual Telephone Co.	300, 550, 600 c.w.

HOLLAND

(See note F)

Amsterdam AD ..	52° 22' 23" N. 04° 53' 02" E.	AD	200	—	1,500, 1,700 C.W
Amsterdam PA ₅		PA ₅	—	Smith & Hooghoudt ..	1050 t'py.
Amsterdam PCA ..	52° 22' 27" N. 04° 54' 45" E.	PCA	—	Navy	600
Amsterdam PCFF	—	PCFF	—	Stock Exchange ..	2,000 t'py.
Vaz Dias					
Flushing	51° 26' 52" N. 03° 35' 35" E.	PCD	200	Navy	600 spk.
Helder PCB	52° 57' 49.5" N. 04° 46' 33" E.	PCB	—	Government	600 spk.
Helder PCC	52° 57' 05" N. 04° 46' 23.5" E.	PCC	—	Government	600 spk.
Hilversum	—	—	—	Ned. Seintoestellen Fabriek	1,050 t'py.
Ijmuiden	—	PCMM	—	—	1,050 t'py.
Kootwijk-Meyendei	52° 10' 24" N. 05° 49' 30" E.	PCG	5,000- 6,000	Government	8,800, 13,400
Mok (De)	53° 00' 02" N. 04° 45' 56.5" E.	PCE	—	—	17,800 c.w. 600 spk.
Noord-Hinder Light- ship	51° 35' 30" N. 02° 36' 43" E.	PCN	60	N.T.M. Radio-Holland	400, 600 spk.
Rotterdam (T)	51° 52' 36" N.	RDM	500	—	900, 1,400
(Waalhaven)	04° 27' 26" E.	Rotterdam			c.w. & t'py.
Rotterdam	51° 53' 14" N. 04° 29' 23" E.	RT	325	Government	1,500, 1,550, 1,560, 1,750, 2,250 c.w.
Scheveningen Port ..	52° 05' 40" N. 04° 15' 30" E.	PCH	250	Government	300, 500, 600, 1,800 (W) spk. & c.w.
Schiphol	52° 18' 05" N. 04° 48' 05" E.	SPL	—	Army	900 c.w. & t'py.
Soesterberg (T) ..	52° 08' 00" N. 05° 17' 00" E.	Schiphol STB	—	Army	700, 900, 1,400, 1,680 c.w.
Terschellinger Bank Lightship	53° 29' 00" N. 04° 02' 00" E.	PCM	60	N.T.M. Radio-Holland	400, 600 spk.
The Hague	—	PCGG	—	Radio-Industries ..	1,085 t'py.
The Hague (Heussen Laboratory)	—	PCUU	—	—	1,050 t'py.
Vliegkampen	—	PCF	—	General call for aerodromes	—

HONDURAS

Swan Island ..	17° 24' N. approx. 83° 57' W. approx.	US	—	United Fruit Co. ..	2,240 spk.
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HONG-KONG

Cape D'Aguilar ..	22° 13' 00" N. 114° 16' 00" E.	VPS	350	Post Office	300, 600 (W) 1,800 spk.
Cape D'Aguilar D.F.	22° 12' 37" N. 114° 15' 30" E.	VPS	—	Government	450, 600, 800 spk.
Stonecutters Island..	22° 19' 17.7" N. 114° 08' 40" E.	BXY	—	British Admiralty ..	2,000 (T) spk.

HUNGARY

Csepel	47° 28' 29" N. 19° 03' 26" E.	HB	1,070	Government	2,800-7,000, 4,700 (W) c.w.
Székesfehérvár ..	47° 09' 40" N. 18° 24' 00" E.	HAR	1,000- 2,000	Government	3,000, 3,600, 4,000, 4,800, 5,400, 7,200, 8,000, 14,400 c.w.

ICELAND

Flatey á Breidafirdi	65° 22' 30" N. 22° 55' 24" W.	TFB	250	Government	300, 600 spk.
Hesteyri	66° 19' 54" N. 22° 52' 55" W.	TFE	150	Government	450 c.w.
Kirkjubaejarklaustur	63° 47' 10" N. 18° 03' 47" W.	TFD	150	Government	490 c.w.
Reykjavik Radio ..	64° 08' 55" N. 21° 57' 11" W.	TFA	500	Government	300, 600, 900, 1,800 spk.
Vestmannaeyjar Radio	63° 26' 20" N. 20° 16' 10" W.	TFC	200	Government	600, 1,450 c.w.

INDIA (BRITISH)					
Allahabad Radio ..	25° 26' 00" N. 81° 55' 00" E.	VWA	—	—	2,300 spk.
Bombay Radio ..	18° 57' 31" N. 72° 54' 13" E.	VWB	350	Indian Government ..	300, 600, 1,000 2,000 (W) spk.
Calcutta Radio ..	22° 33' 31" N. 88° 20' 16" E.	VWC	350	Indian Government ..	300, 600, 1,000 2,000 (WT) spk.
Delhi Radio ..	28° 39' 15" N. 77° 14' 30" E.	VWD	—	—	2,700 spk.
Diamond Island ..	15° 51' 47" N. 94° 16' 51" E.	VTD	—	Indian Government	600 spk.
Jutogh Radio ..	31° 06' 15" N. 77° 06' 30" E.	VWJ	—	—	1,400 spk.
Karachi Radio ..	24° 51' 05" N. 67° 02' 32" E.	VWK	350	Indian Government ..	2,300 c.w. 300, 600, 1,000, 2,000 (W) spk.
Lahore Radio ..	31° 30' 00" N. 74° 24' 00" E.	VWL	—	—	3,500 c.w. 1,900 spk.
Madras Fort ..	13° 05' 00" N. 80° 17' 15" E.	VWO	—	Indian Government	4,000 c.w.
Madras Radio ..	12° 59' 17" N. 80° 10' 56" E.	VWM	350	Indian Government ..	600, 800, 1,000 (W) spk.
Mhow Radio ..	22° 32' 55" N. 75° 45' 23" E.	VWH	—	—	1,500 spk.
Mingaladon Radio ..	16° 57' 30" N. 96° 10' 30" E.	VTO	—	Indian Government	3,040 c.w.
Nagpur Radio ..	21° 10' 00" N. 79° 05' 00" E.	VWN	—	—	2,600 spk.
Peshawar Radio ..	34° 02' 00" N. 71° 40' 00" E.	VWP	—	—	1,800 spk.
Poona Radio ..	18° 29' 58" N. 73° 55' 34" E.	VVO	—	—	1,100 c.w.
Port Blair ..	11° 39' 34" N. 92° 45' 36" E.	VTP	500	Indian Government ..	600, 1,200 (W) spk.
Quetta Radio ..	30° 15' 00" N. 67° 00' 00" E.	VWQ	—	—	2,600 spk.
Rangoon Radio ..	16° 45' 54" N. 95° 11' 42" E.	VTR	350	Indian Government ..	300, 600, 1,200 (W) spk.
Secunderabad Radio	17° 32' 00" N. 78° 33' 00" E.	VWT	—	—	3,000 spk.
Victoria Point ..	09° 59' 15" N. 98° 33' 15" E.	VTV	350	Indian Government ..	300, 600, 1,200 spk.
IRAQ					
Basrah ..	30° 31' 00" N. 47° 52' 00" E.	VTC	400 1,000	Indo-European Tele- graph Dept.	300, 600 spk. 3,000 c.w.
IRISH FREE STATE					
Clifden Radio*	53° 27' 00" N. 10° 01' 00" W.	MFT	2,000	Marconi Company ..	5,780 spk. & c.w.
Falcarragh ..	55° 08' 10" N. 8° 06' 10" W.	FCQ	15	Post Office (Irish) ..	250
Malin Head ..	55° 21' 45" N. 7° 20' 30" W.	GMH	250	Post Office (British)	300, 600 (W) spk.
Tory Island ..	55° 16' 10" N. 8° 13' 45" W.	To I	15	Post Office (Irish) ..	250
Valentia ..	51° 55' 51" N. 10° 20' 53" W.	GCK	250	Post Office (British) ..	300, 600 (W) spk.
ITALIAN SOMALI- LAND					
Bardera ..	02° 21' 10" N. 42° 16' 15" E.	ISN	—	Government ..	—
Brava ..	01° 06' 25" N. 44° 02' 04" E.	ISC	120	Government ..	300, 600 spk.
Bulo Burti ..	03° 52' 00" N. 45° 34' 00" E.	ISJ	—	Government ..	—
Cape Guardafui D.F.	11° 44' 50" N. 51° 13' 15" E.	—	—	—	600 spk.
Giohar ..	3° 14' 24" N. 45° 32' 15" E.	ISA	50	Government ..	450, 600 spk.
Giumbo ..	00° 14' 51" S. 42° 37' 27" E.	ISD	200	Government ..	300, 600 spk.
Hafun, Danté Ali- ghieri Radio	10° 34' 00" N. 51° 07' 00" E.	ISP	50	Government ..	600 spk.
Iscia Baidoa ..	03° 07' 10" N. 43° 39' 31" E.	ISH	—	Government ..	—

**ITALIAN SOMALI-
LAND—contd.**

Itala	02° 45' 27" N. 46° 19' 47" E.	ISM	50	Government	300, 600 spk.
Lugh	03° 48' 00" N. 42° 36' 00" E.	ISO	—	Government	—
Mahaddei Uen ..	02° 58' 14" N. 45° 31' 01" E.	ISF	—	Government	—
Merka	01° 42' 49" N. 44° 46' 32" E.	ISB	50	Government	300, 600 spk.
Mogadiscio ISE	02° 02' 13.5" N. 45° 21' 32" E.	ISE	160	Government	300, 600 spk.
Mogadiscio ISG	02° 02' 13.5" N. 45° 21' 14.5" E.	ISG	—	—	2,850 (T)
Obbia	05° 20' 01" N. 48° 31' 55" E.	ISQ	200	—	400, 600 spk
Oddur	04° 07' 05" N. 43° 45' 00" E.	ISI	—	Government	—
ITALY					
(See note G)					
Alessandria	—	—	—	Army	—
Ancona	—	—	—	Army	—
Ancona IQW	43° 37' 00" N. 13° 31' 50" E.	IQW	—	Army	—
Aspio Radio	43° 31' 30" N. 13° 31' 25" E.	ICA	270	Government	300, 600 spk.
Bologna	—	—	—	Army	—
Brescia	—	—	—	Army	—
Brindisi Radio	40° 38' 45" N. 17° 57' 08" E.	ICE	270 300	Government	300, 600, spk. 2,400 c.w.
Cagliari	Sardinia	—	—	Army	—
Capo Sperone Radio (Sardinia)	38° 57' 59" N. 08° 24' 42" E.	ICR	270	Government	300, 600 (W) spk.
Catania (Sicily) ..	—	—	—	Army	—
Catanzaro	—	—	—	Army	—
Chieti	—	—	—	Army	—
Civitavecchia Radio	42° 05' 21" N. 11° 47' 25.9" E.	IDL	120	Government	300, 600 spk.
Coltano	—	ICC	—	—	10,750 (Pr), 14,814 c.w. 5,800 c.w.
Coltano (Guglielmo Marconi)	43° 38' 35" N. 10° 24' 06" E.	ICI	—	—	—
Cotrone Radio	39° 04' 50" N. 17° 07' 56" E.	IDH	120	—	300, 600 spk.
Cuneo	—	—	—	Army	—
Fiume Radio	45° 26' 14" N. 14° 25' 14" E.	IQB	200 600	Soc. Fiumena per la Rad. Comm.	600 spk. 2,700, 3,200, 4,100 c.w.
Florence	43° 40' 36" N. 11° 10' 25" E.	—	—	Army	—
Genoa	—	—	—	—	—
Genoa Radio	44° 25' 44" N. 08° 56' 02" E.	ICB	270 500	Government	300, 600, spk. 2,070, 2,400, 2,700 2,900, 3,500, 4,000, 4,500 c.w.
Lampedusa Island ..	35° 31' 00" N. 12° 37' 00" E.	ICL	—	—	—
Lipari Island	38° 28' 00" N. 14° 57' 15" E.	IDD	—	—	—
Leghorn	43° 31' 31" N. 10° 18' 32.8" E.	IDK	—	Army	—
Maddalena Radio (N. of Sardinia)	41° 12' 50" N. 09° 25' 10" E.	ICH	270	Government	300, 600 spk.
Messina	38° 15' 00" N. 15° 37' 27" E.	IFM	—	Government (State Railways)	—
Messina Radio	38° 15' 30" N. 15° 37' 50" E.	ICF	120, 300	Government	300, 600 spk.
Milan	—	—	—	Army	—
Murano D.F.	45° 27' 30" N. 12° 22' 20" E.	IRM	—	Government	300, 600 spk.
Naples Radio	40° 50' 34" N. 14° 14' 42" E.	ICN	270 300	Government	300, 600, spk. 2,400 c.w.
Novara	—	—	—	Army	—
Padua	—	—	—	Army	—
Palermo Radio (Sicily)	38° 11' 50" N. 13° 16' 00" E.	ICP	270	Government	300, 600 spk.

ITALY—con'd.

Pantelleria Island ..	36° 49' 00" N. 11° 57' 25" E.	ICG	—	—	—
Perugia	—	—	—	—	Army
Piacenza	—	—	—	—	Army
Pola	44° 51' 10" N. 13° 50' 50" E.	IQZ	300	—	Army 300, 600 spk.
Potenza	—	—	—	—	Army
Ravenna	—	—	—	—	Army
Reggio Calabria ..	38° 08' 00" N. 15° 38' 30" E.	IFR	—	—	Government
Rome	—	—	—	—	Army
Rome Centocelle ..	41° 52' 10" N. 12° 33' 06" E.	ICD	—	—	Government 2,250 (W Pr) c.w.
Rome San Paolo ..	41° 52' 00" N. 12° 31' 00" E.	IDO	—	—	Government 10,850 (W Pr) c.w.
Salerno	—	—	—	—	Army
Sasena (Albania) ..	40° 29' 52" N. 19° 17' 17" E.	IDB	—	—	Army
Smyrna	Warship in Harbour	IQL	—	—	— 600
Spezia	44° 05' 34.6" N. 09° 49' 03.8" E.	ICS	—	—	Army
Stromboli Island ..	38° 48' 10" N. 15° 14' 30" E.	IDE	120	—	Government 300, 600 spk.
S. Cataldo Di Bari ..	41° 08' 23" N. 16° 50' 47" E.	ICQ	120	—	Government 300, 600 spk.
Taranto	40° 28' 02" N. 17° 18' 07" E.	ICT	—	—	Army
Tempio	40° 53' 56" N. 09° 06' 08" E.	IDR	270	—	Government 2,400 c.w.
(Sardinia)	—	—	—	—	—
Trieste Radio ..	45° 38' 54" N. 13° 45' 29" E.	IQX	200	—	— 300, 600 spk.
Turin	—	—	—	—	Army
Ustica Island ..	38° 42' 25" N. 13° 10' 45" E.	IDS	—	—	—
Venice Radio ..	45° 28' 50" N. 12° 21' 10" E.	ICZ	200	—	Government 300, 600 spk.
Verona	—	—	—	—	Army
Villa San Giovanni ..	38° 10' 00" N. 15° 38' 00" E.	IFV	—	—	Government
Vittoria Radio ..	36° 57' 00" N. 14° 32' 00" E.	ICV	270	—	Government 300, 600 spk.
(Sicily)	—	—	—	—	—

JAMAICA. (See
British West Indies)**JAPAN**

(See note H)

Chosi Radio	35° 44' 08" N. 140° 51' 12" E.	JCS	550	—	Ministry of Communi- cations 300, 600 (T), 1,800 spk.
Dairenwan	38° 57' 50" N. 121° 53' 15" E.	JDA	350	—	Ministry of Communi- cations 300, 600 spk.
Funabashi Radio ..	—	JJC	—	—	Ministry of Marine and Ministry of Commu- nications 4,000 (T), 7,000 c.w.
Horomushiro Radio	50° 29' 20" N. 156° 07' 30" E.	JHJ	550	—	Ministry of Communi- cations 300, 600, 1,800 spk.
Hozan	22° 37' N. approx. 120° 20' E. approx.	JMD	400	—	Government 600, 1,800 spk.
Ishikari	43° 15' N. approx. 141° 20' E. approx.	JNY	—	—	Government 600 spk.
Iwaki Radio	37° 37' 10" N. 140° 56' 30" E.	JAA	5,000	—	Ministry of Communi- cations 15,500 14,600 c.w.
Kaigo Met. Obs. (Kobe)	34° 41' 00" N. 135° 11' 00" E.	JTJ	—	—	— 600, 750 (W) spk.
Kanazawa	36° 35' N. approx. 136° 38' E. approx.	JBV	—	—	Government 600 spk.
Keijo Radio	37° 51' 18" N. 126° 58' 41" E.	JMAA	1,000	—	Government 600, 1,800 2,000, 2,500 spk.
Keelung Radio ..	25° 07' 58" N. 121° 45' 10" E.	JFK	1,000	—	Ministry of Communi- cations 300, 450, 600 (W), 1,800, 2,500 spk.
Komonto Island ..	34° 05' 55" N. 126° 36' 12" E.	JKM	200	—	—
Maizuru Radio ..	35° 27' 00" N. 135° 19' 00" E.	JMZ	1,500	—	Ministry of Communi- cations 600, 1,500 spk.
Minamioagarijima ..	25° 51' 00" N. 131° 15' 00" E.	JYU	200	—	Ministry of Communi- cations 300, 600 spk.
Mokuho	34° 47' 03" N. 126° 23' 05" E.	JMP	200	—	—
(Chosen)	—	—	—	—	—

JAPAN—contd.

Nawa Radio	26° 18' N. approx. 127° 45' E. approx.	JCX	400-1,000	Government	600, 2,400, 3,000 c.w. 600 spk.
Odomari	46° 36' 40" N. 142° 46' 35" E.	JTW	—	—	—
Osezaki Radio	32° 37' 20" N. 128° 37' 08" E.	JOS	550	Ministry of Communi- cations	300, 600, 1,800 spk.
Otchishi Radio	43° 10' 17" N. 145° 30' 20" E.	JOC	550	Ministry of Communi- cations	300, 600 spk.
Otomari Radio	46° 36' 40" N. 142° 46' 46" E.	JTW	450	General Direction of Posts and Telegraphs	300, 600, 1,800 s k.
Rasajima (Island)	24° 29' 30" N. 131° 13' 00" E.	JSA	450	Ministry of Communi- cations	300, 600, 1 800 spk.
Shiba Radio	35° 39' 00" N. 139° 15' 16" E.	JSDA	400	Government	300, 600, 1,800 spk.
Shimotsui Radio	34° 26' 30" N. 133° 48' 05" E.	JSX	1,000 300	Ministry of Communi- cations	2,400, 1,800 c.w. 300, 600, 1,800 spk.
Shiomisaki Radio	33° 25' 32" N. 135° 46' 08" E.	JSM	450	Ministry of Communi- cations	300, 600 spk.
Shogetsubito	37° 28' 19" N. 126° 36' 20" E.	JSB	200	—	—
Shoseito	37° 45' 36" N. 124° 43' 45" E.	JSS	300	—	—
Tsunoshima Radio	34° 21' 00" N. 130° 50' 00" E.	JTS	450	Ministry of Communi- cations	300, 600 spk.
Wakkani	45° 25' 36" N. 141° 40' 13" E.	JFQA	200	—	600

KENYA COLONY

Kismayu	00° 21' 57" S. 42° 33' 30" E.	VQQ	300	—	600 spk.
Mombasa	04° 03' 11" S. 39° 39' 51" E.	VPQ	350	Government	300, 600, 1,800 spk.

LABRADOR. (See
under Newfoundland)**LATVIA (LETTONIA)**

Liepaja KCB	56° 32' 48" N. 21° 00' 36" E.	KCB	200	Post and Telegraphs ..	300, 600, 800, 1,200 spk.
Liepaja KCQ	56° 32' 48" N. 21° 00' 36" E.	KCQ	1,500	Posts & Telegraphs ..	1,650, 2,650 (W) 3,100, 3,700, 5,800 c.w.
Riga (T)	56° 56' 52" N. 24° 05' 24.6" E.	KCA	500	Posts & Telegraphs ..	300, 600 (W) 700, 1,400 spk. 400, 600 (W) 1,500, 1,600 c.w.
Ventspils	—	KCC	—	Posts & Telegraphs ..	600 spk.

LIBERIA

Monrovia	06° 18' 28" N. 10° 48' 35" W.	FMA	400	Government of Fr. W. Africa	600 spk.
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LITHUANIA

Klaipéda (Memel)	55° 42' 10" N. 21° 07' 20" E.	RYM	250	—	300, 600, 800 (W) 1,200 spk.
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MACAO

Macao	22° 12' 15" N. 113° 34' 23" E.	CRS	600	Government	300, 600 spk.
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MADAGASCAR

Diégo-Suarez	12° 15' 04" S. 49° 22' 45" E.	HYD	Day 325 Night 650	Government	300, 600 spk.
Dzaoudzi	12° 46' 55" S. 45° 16' 29" E.	HYH	430	Government	300, 600 spk.
(Comoro Islands)	13° 24' 21" S. 48° 17' 19" E.	HYJ	160	Army	1,800 c.w.
Hellville	—	HYM	—	Government	3,000 c.w.
Ilot Madame	15° 43' 00" S. 46° 20' 14" E.	HYE	430	Government	300, 600 spk.
Majunga	11° 43' 00" S. 43° 15' 37" E.	HYI	150	Government	600, 900 spk.
M'Dé (Comoro Is.)	12° 09' 26" S. 44° 24' 27" E.	HYG	100	Government	600 spk.
Mutsamudu (Comoro Islands)	—	HYL	—	Government	600 (W) spk.
Tamatave	18° 58' S. approx. 47° 30' E. approx.	HZD	—	Government	14,900 c.w.
Tananarive	—	—	—	—	—
(Antananarivo)	—	—	—	—	—

MADEIRA

Funchal	32° 38' 11" N. 16° 54' 27" W.	PQU	190	Administration of Posts and Telegraphs	300, 600 spk.
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MAJORCA.

(See under Spain)

MALTA

(See note J)

Calafrana	35° 48' 55" N. 14° 32' 10" E.	GHA	1,200	British Air Force ..	4,800 (W) c.w.
Castille, Malta ..	35° 53' 39" N. 14° 30' 42" E.	BVK	—	—	—
Malta.. .. .	35° 55' 15" N. 14° 29' 24" E.	VPT	200	Marconi's Wireless Telegraph Co. and Eastern Telegraph Co.	300, 600, spk. 2,100 c.w.
Rinella	35° 53' 28" N. 14° 31' 43" E.	BYZ	—	British Admiralty ..	3,900, 4,700 (W) c.w.
S. Angelo	35° 53' 00" N. 14° 31' 00" E.	BYY	—	British Admiralty ..	—

MARIANNE ISDS.
(See under Pacific
Islands)

MARSHALL ISDS.
(See under Pacific
Islands)

MARTINIQUE

(See note K)

Fort de France ..	14° 35' 50" N. 61° 04' 00" W.	HZH	1,000	French Navy ..	600, 800, 1,000, 1,200, 1,600 spk.
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MAURITIUS

Mauritius	20° 10' 00" S. 57° 35' 00" E.	BZG	500	Government	300, 450, 600, 1,000 spk.
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MEXICO

Acapuleo de Guerrero	16° 50' 41" N. 99° 54' 26" W.	XAK	300	Government	600, 900, 1,200 spk.
Alamos de Sonora ..	27° 01' 19" N. 108° 55' 59" W.	XAD	500	Government	600, 900, 1,200 spk.
Campeche	19° 51' 40" N. 90° 32' 14" W.	XAB	300	Government	600, 900, 1,200 spk.
Chapultepec (Mexico City)	19° 25' 00" N. 99° 11' 11" W.	XDA	—	—	1,200 (T), 2,000 (W), 4,500 (W), 5,800 (T) spk.
Hermosillo	29° 04' 28" N. 110° 57' 51" W.	XAH	300	Government	300, 600, 900 spk.
Isla Maria Madre ..	21° 30' 45" N. 106° 33' 14" W.	XAO	300	Government	600, 900, 1,200 spk.
Mazatlan de Sinaloa	23° 11' 55" N. 106° 25' 20" W.	XAE	300	Government	600, 900, 1,200 spk.
Mérida de Yucatán ..	20° 58' 05" N. 89° 37' 21" W.	XAM	300	Government	600, 900, 1,200 spk.
Payo Obispo	18° 29' 39" N. 88° 21' 30" W.	XAC	300	Government	600, 900, 1,200 spk.
Pas de la Baja, California (La)	24° 10' 12" N. 110° 21' 05" W.	XAF	300	Government	600, 900, 1,200 spk.
Puerto Lobos	21° 28' 00" N. 97° 13' 03" W.	XAL	300	Government	600, 900, 1,200 spk.
Salina Cruz	16° 09' 37" N. 95° 12' 11" W.	XAN	300	Government	600 spk.
S. Rosalia de la Baja, California	27° 24' 00" N. 112° 20' 00" W.	XAG	100	Government	600 spk.
Tampico de Tamaulipas	22° 13' 00" N. 97° 51' 19" W.	XAJ	300	Government	600, 900, 1,200 spk.
Tuxpan de Veracruz	20° 57' 18" N. 97° 23' 59" W.	XAI	300	Government	600, 900, 1,200 spk.
Veracruz de Veracruz	19° 12' 02" N. 96° 08' 16" W.	XAA	500	Government	600, 900, 1,200 spk.

MOROCCO (French).
(For Spanish Morocco, see under Spain)

Agadir	30° 26' 15" N. 09° 36' 30" W.	CNA	400	French Army ..	300, 600, 800 spk.
Casablanca Aerodrome (T)	33° 34' 11" N. 07° 40' 04" W.	CNO	450 Morse	French Aero. Dept. ..	900 c.w. & t'py. 1,400, 2,200 c.w.
Casablanca, Maroc ..	33° 36' 30" N. 07° 37' 00" W.	Casablanca CNP	250 t'py. 430	French Protect. ..	300, 600 (DF) spk.
Chétéba D.F. ..	33° 35' 21" N. 07° 34' 10" W.	CNP	—	French Navy.. ..	450, 800
Kenitra D.F. ² ..	34° 18' 49" N. 6° 36' 00" W.	CNK	120	French Government ..	450, 600, 800 spk.
Médiouna	33° 27' 00" N. 07° 31' 00" W.	CNM	—	French Navy ..	600, 1,500 (W) spk. 5,000 (W.) c.w. Rec. only
Rabat	34° 06' 15" N. 6° 49' 47" W.	CNR	—	French Prot. Govern-	—
Tangier	35° 47' 15" N. 05° 49' 00" W.	CNW	430	French Prot. Govern-ment	300, 600, 800 spk.

MOZAMBIQUE

Beira	19° 50' 16" S. 34° 50' 48" E.	CRT	200	Mozambique Co. ..	600, 900, 1,000 spk.
Buzi	19° 52' 20" S. 34° 32' 00" E.	CRCC	25	Mozambique Co. ..	300, 350, 600, 800 spk.
Inhambane	23° 51' 55" S. 35° 22' 50" E.	CRY	300	Government	300, 600 spk.
Lourenço Marques ..	25° 58' 05" S. 32° 35' 39" E.	CRZ	300	Government	300, 600 (TW) spk.
Mozambique.. ..	15° 01' 47" S. 40° 45' 06" E.	CRV	300	Government	300, 600 spk.
Quelimane	17° 52' 03" S. 36° 52' 55" E.	CRW	200	Government	600, 900, 1,000 spk.

NEW BRITAIN
(See under New Guinea)**NEW CALEDONIA**
Nouméa-Semaphore

22° 16' 20" S. 166° 26' 53" E.	HZG	Day 400	Government	300, 600 spk.
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NEW HEBRIDES

Port-Vila	17° 44' 06" S. 168° 19' 08" E.	HVW	Day 380 Ngt. 1,350	Administration ..	600, 850 spk.
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NEWFOUNDLAND AND LABRADOR

(See note L)

(See also under Canada for stations controlled by Canadian Government.)

American Tickle (Labrador)	53° 28' 00" N. 55° 41' 00" W.	VOC	100	Marconi Co. of Canada	600 spk.
Battle Harbour (Labrador)	52° 17' 00" N. 55° 36' 00" W.	VOA	150	Marconi Co. of Canada	300, 600 spk.
Cape Bauld (Radio Beacon)	51° 38' 41" N. 55° 23' 03" W.	VCZ	35	—	1,000 spk.
Cape Harrison (Labrador)	54° 52' 00" N. 58° 03' 00" W.	VOH	150	Marconi Co. of Canada	600 spk.
Cape Ray (Radio Beacon)	47° 37' 02" N. 59° 18' 20" W.	VCR	50	—	1,000 spk.
Domino (Labrador)	53° 28' 00" N. 55° 44' 00" W.	VOD	150	Marconi Co. of Canada	600 spk.
Fogo	49° 42' 00" N. 54° 13' 00" W.	VOJ	250	Marconi Co. of Canada	300, 600 spk.
Grady (Labrador)	53° 48' 00" N. 56° 23' 00" W.	VOE	150	Marconi Co. of Canada	600 spk.
Holton (Labrador)	54° 35' 00" N. 57° 15' 00" W.	VOG	150	Marconi Co. of Canada	600 spk.
Makkovik (Labrador)	55° 13' 00" N. 59° 08' 00" W.	VOI	150	Marconi Co. of Canada	600 spk.
S. John's	47° 31' 00" N. 52° 52' 00" W.	BZM	—	—	—
Smokey Tickle (Labrador)	54° 26' 00" N. 57° 11' 00" W.	VOF	150	Marconi Co. of Canada	600 spk.
Venison Islands (Labrador)	53° 14' 00" N. 55° 46' 00" W.	VOB	100	Marconi Co. of Canada	600 spk.

NEW GUINEA

BRITISH NEW GUINEA

Aitape Radio ..	03° 08' 02" S. 142° 21' 02" E.
Madang Radio ..	05° 12' 40" S. 145° 49' 30" E.
Morobe Radio ..	07° 45' 30" S. 147° 39' 03" E.

PAPUA

Port Moresby Radio	09° 28' 17" S. 147° 09' 20" E.
Samarai Radio ..	10° 30' 49" S. 150° 39' 46" E.

ADMIRALTY

ISLAND

Manus Radio ..	02° 01' 30" S. 147° 17' 12" E.
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NEW BRITAIN

Rabaul Radio ..	04° 23' 50" S. 152° 18' 15" E.
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NEW IRELAND

Kaewiang Radio ..	02° 34' 30" S. 150° 48' 45" E.
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SOLOMON ISLANDS

Kieta Radio ..	06° 12' 15" S. 155° 39' 36" E.
Tulagi	09° 06' 40" S. 160° 09' 40" E.

NEW HEBRIDES

(See under New Caledonia)

NEW ZEALAND

Aitutaki	19° 00' 00" S.
(Cook Islands) ..	159° 45' 00" W.
Auckland Radio ..	36° 50' 36" S. 174° 46' 08" E.
Awanui	35° 04' 50" S. 173° 14' 34" E.
Awarua	46° 30' 27" S. 168° 22' 21" E.
Hector-Astronomical Observatory, Wellington	—
Kawau Island ..	36° 26' 00" S. 174° 50' 00" W.
Mangaia	22° 00' 00" S.
(Cook Islands)	153° 00' 00" W.
Niue T.	18° 45' 00" S.
(Cook Islands)	169° 45' 00" W.
Wellington Radio ..	41° 16' 26" S. 174° 45' 55" E.

NICARAGUA

Managua	12° 17' 00" N. 86° 17' 00" W.
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NIGERIA

Lagos.. ..	06° 26' 35" N. 03° 23' 55" E.
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NORWAY

(see note M)

Bear Island ..	74° 30' 00" N. 20° 40' 00" E.
Bergen Radio (D.F. ³)	60° 24' 30" N.
(T)	05° 22' 00" E.

VZX	200	Australian Government	300, 600, 800 spk.
VIV	200	Australian Government	300, 600, 800 1,600 spk.
VZK	200	Australian Government	300, 600, 800 spk.
VIG	500	Australian Government	300, 450, 600 spk.
VIJ	350	Australian Government	300, 450, 600 spk.
VZO	200	Amalgamated Wireless (Australasia), Ltd. ..	300, 600, 800 spk.
VJZ	1,000	Australian Government	300, 600, 800, 2,500 spk. and Arc.
VZR	200	Australian Government	300, 600, 800 spk.
VIU	200	Australian Government	300, 600, 800 spk.
VQJ	Day 1,000 Ngt. 1,600	Australian Government	720, 1,800, 2,500 spk.
VLF	Day 150 Night 300	Government	450, 600 spk.
VLD	325	Government	300, 600 spk.
VLA	Day 500 Ngt. 1,000	Government	300, 600 (W), 1,000, 2,000, 2,500, 3,500 spk.
VLB	Day 300 Ngt. 600	Government	300, 600, 1,000, 2,000, 2,500, 3,500 spk.
VLV	—	—	Controls Wellington Time Signals
VLO	30	Government	600 c.w.
VLG	Day 150 Night 300	Government	450, 600 spk.
VLK	350	Government	450 t'py.
VLW	325	Government	300, 600 (WT) spk.
NAZ	300	U.S. Navy	952, 1,874 spk.
VPY	250	—	300, 600 spk.
LWP	230	Private	600 spk.
LGN	350 spk. 1,200 c.w. 350 t'py.	Government	300, 600, 1,800 spk. 600, 1,800, 1,850 (W) 2,100, 2,400, 2,900 c.w. & t'py.

NORWAY—*contd.*

Fauske Radio ..	67° 15' 28.1" N. 15° 23' 17.35" E.	LDW	200	Government	300, 600, 1,600, 1,800, 2,100 s k.
Flekkerøy Radio ..	58° 04' 05" N. 07° 59' 00" E.	LDF	160	Government	300, 600 spk. & t'py.
(T) Forsvarsdepartemen- tets R.S.	Oslo	LBV	—	Government	—
Ingøy Radio (D.F. ³)	71° 04' 25" N. 24° 09' 20" E.	LEI	480	Government	300, 600 spk.
Jan Mayen	71° 00' 00" N. 08° 50' 00" E.	JN	500	Government	600, 1,000 (W) 1,600
Karljohansvern ..	Oslo Fjord	LBZ	—	Government	—
Lille Faerder Light- house (Beacon)	59° 01' 36" N. 10° 31' 54" E.	TRW	30	—	1,000 spk.
Oslo Radio	59° 59' 01" N. 10° 40' 26" E.	LCH	700	Government	4,100, 5,450 (W Pr) 8,200 c.w.
Ramsund R.S. ..	Ofoten Fjord	LBX	—	—	—
Röst (D.F.)	67° 30' 22.86 N. 12° 04' 33.79 E.	LFR	200	Government	300, 600, 1,600 spk.
Sörvogen	67° 53' 30" N. 13° 02' 00" E.	LEN	35	Government	300, 600 spk.
Spitsbergen (D.F. ³)	78° 02' 26" N. 14° 14' 27" E.	LFG	400	Government	300, 600 spk.
Stavanger Radio ..	58° 56' 23" N. 05° 40' 39" W.	LCM	—	Government	12,140 i.c.w.
Tjømø Radio	59° 03' 05" N. 10° 24' 05" E.	LET	160	Government	600 spk.
Utsire Radio (D.F. ³)	59° 18' 10" N. 04° 55' 08" E.	LGK	230	Government	300, 600 spk.
Væroy	67° 40' 00" N. 12° 41' 00" E.	LDB	20	Government	600 spk.
Vardø (T)	70° 22' 19" N. 31° 05' 55" E.	LEK	200	Government	300, 450, 600, c.w. 510 t'py.

PACIFIC ISLANDS

GILBERT AND
ELLICE ISLANDS

Ocean Island ..	00° 51' 47" S. 169° 34' 48" E.	VQK	1,000	Government of Colony	300, 600, 700, 1,650, 2,000 spk.
Tarawa	1° 20' 33" N. 172° 55' 30" E.	VQM	300	Burn, Philp & Co. ..	600 spk.

CHATHAM
ISLANDS

Chatham Islands ..	43° 57' 02" S. 176° 31' 04" W.	VLC	300	Government	300, 600, 1,600 (FX) spk.
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COOK ISLANDS

Aitutaki	18° 52' 32" S. 159° 45' 30" W.	VLF	400	New Zealand Adminis- tration	450, 600
Mangaia	21° 55' 00" S. 157° 56' 00" W.	VLG	400	New Zealand Adminis- tration	450, 600
Rarotonga	21° 11' 54" S. 159° 48' 51.4" W.	VMR	Day 500 Night 850	New Zealand Adminis- tration	300, 600, 1,700 300, 600, 680, 1,200, 1,600 (FX) spk.

MARSHALL
ISLANDS

Nauru Radio ..	00° 25' 23" S. 166° 56' 28" E.	VKT	1,000	Australian Administra- tion	300, 600, 2,250 spk.
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MARIANNE
ISLANDS

Guam	13° 27' 15" N. 144° 44' 42" E.	NPN	300-3,500	U.S. Navy	600, 952, 2,100, 2,254, 3,950, 5,996, 9,086 spk. & c.w.
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TONGA
ISLANDS

Niue Island ..	19° 5' 00" S. appr. 169° 55' 00" W.,	VLK	350	New Zealand Adminis- tration	450
Nukualofa Radio ..	21° 07' 57.5 S. 175° 12' 05" W.	VSB	520	Government	300, 600, 680, 1,200, 1,600 (FX) spk.

PANAMA
PANAMA
REPUBLIC

Cape Mala	07° 27' 30" N. 79° 59' 30" W.	NNT	300	U.S. Navy	600, 1,910
Palma (L')	08° 26' 00" N. 78° 08' 30" W.	NNW	300	U.S. Navy	800, 1,817 spk.
Puerto Obaldia	09° 33' 00" N. 79° 13' 00" W.	NRK	300	U.S. Navy	600, 1,986
CANAL ZONE					
Balboa	09° 07' 15" N. 79° 46' 20" W.	NBA	300-3,000	U.S. Navy	600, 952, 2,250, 2,400 spk., 3,950, 6,663 (T Pr) 8,860, 9,790, 17,145 c.w.
Colon	09° 21' 56" N. 79° 54' 01" W.	NAX	300	U.S. Navy	600, 952, 1,817, 2,726 spk.
Fort de Lesseps	—	WUCG	25	U.S. Army	400 c.w.
Fort Grant	—	WUBE	25	U.S. Army	400 c.w.
Fort Randolph	—	WUCI	25	U.S. Army	400 c.w.
Fort Sherman	—	WUCH	25	U.S. Army	400 c.w.
France Field	—	WYP	250	U.S. Army	1,500 c.w.

PERSIAN GULF

Bahrein	26° 13' 46" N. 50° 35' 28" E.	VTE	350	Indo-European Tele- graph Dept.	300, 600 spk.
Bushire	28° 54' 36" N. 50° 49' 43" E.	VTF	350	Indo-European Tele- graph Dept.	300, 600 spk.
Henjam	26° 41' 14" N. 55° 53' 25.5" E.	VTH	300	Indo-European Tele- graph Dept.	300, 600 spk.
Kanawa D.F.	29° 32' 30" N. 50° 32' 00" E.	—	—	—	—
Lingah	26° 33' 34" N. 54° 53' 23" E.	VTL	300	Indo-European Tele- graph Dept.	300, 600 spk.

PERU

Cachendo	16° 56' 10" S. 71° 51' 10" W.	OAB	540	Government	600, 1,500, 3,500 spk.
Casina	09° 20' 00" S. 78° 20' 00" W.	OAS	200	Government	1,000 c.w.
Encanto (El)	00° 56' 00" S. 73° 34' 00" W.	OAU	220	Marconi Company ..	2,000 spk.
Eten	06° 55' 29" S. 79° 53' 06" W.	OAG	220	Government	600, 1,500 spk.
Fronton	12° 07' 25" S. 77° 14' 50" W.	OAF	16	Government	600 spk.
Hablanaves, Callao	12° 03' 15" S. 77° 10' 01" W.	OAA	300 600	Government	450, 600, 800 spk. 2,200, 2,400 (Pr) c.w.
Ilo	17° 36' 54" S. 71° 15' 00" W.	OAL	220	Government	600 spk.
Iquitos	03° 45' 57" S. 73° 12' 00" W.	OAY	810	Government	1,500, 4,000 spk.
Leticia	04° 11' 02" S. 69° 56' 13" W.	OAQ	220	Government	2,000 spk.
Lima (San Cristobal)	12° 02' 09" S. 77° 04' 39" W.	OAZ	810	Government	600, 1,500, 3,500, 4,000 spk.
Magdalena del Mar(T)	12° 06' 00" S. 77° 04' 22" W.	OAN	200	Government	800 c.w.
Masisea	08° 37' 00" S. 74° 28' 35" W.	OAM	220	Government	2,000 spk.
Pisco	13° 42' 45" S. 76° 16' 07" W.	OAP	160	Government	600 spk.
Puerto Maldonado ..	12° 35' 44" S. 69° 15' 40" W.	OAD	—	Government	—
Trujillo	08° 07' 56" S. 79° 03' 40" W.	OAT	220	Government	600, 1,500 spk.

PHILIPPINE
ISLANDS

Aparri	18° 21' 30" N. 121° 38' 05" E.	KZAD	100	Government	550, 600, 1,100 c.w.
Balabac	07° 59' 00" N. 117° 00' 30" E.	KEW	150	Government	600, 1,200 spk.
Basco	20° 27' 30" N. 121° 59' 00" E.	KZAB	450	Government	600, 952, 1,200, 1,500, 1,800, 2,400 spk.

PHILIPPINE ISLANDS—contd.

Batangas	13° 47' 00" N. 121° 00' 00" E.	KPC	1,000	Government	400, 600, 800, 950, 1,200, 1,500, 1,900 spk.
Bongao	05° 02' 00" N. 119° 46' 00" E.	KEO	100	Government	600 spk.
Cagayan de Sulu ..	06° 59' 30" N. 118° 30' 30" E.	KEV	150	Government	750 spk.
Calapan	13° 24' 30" N. 121° 11' 00" E.	KZAC	35	Government	400, 600, 700, 900 spk.
Camp Nichols ..	Rizal	WYT	250	U.S. Army	600 c.w.
Camp Stotsenburg ..	—	WUCA	300	U.S. Army	350 spk.
Cavite	14° 28' 59" N. 120° 54' 35" E.	NPO	300 5,000	U.S. Navy	600, 952, 2,100, 2,701(T W) 3,950, 5,260(T W) 15,530
Cebu	10° 18' 00" N. 123° 50' 00" E.	KPI	450	Government	750, 950 1,250 spk.
Clark Field	Camp Stotsenburg	WYS	25 spk. 150 c.w.	U.S. Army	600 spk. & c.w.
Culion	11° 50' 00" N. 120° 02' 00" E.	KPJ	90	Government	600, 900 spk.
Cuyo	10° 50' 00" N. 121° 00' 00" E.	KIX	175	Government	600, 850 spk.
Davao	07° 00' 00" N. 125° 30' 20" E.	KIF	250	Philippine Insular Government	600, 1,100 spk.
Fort Drum	14° 18' 23" N. 120° 37' 43" E.	WUAL	50	U.S. Army	825 spk.
Fort Frank	14° 16' 20" N. 120° 36' 45" E.	WUAD	50	U.S. Army	600 spk.
Fort John Hay ..	—	WUCB	300	U.S. Army	600 spk.
Fort Mills, WUAG (Corregidor Island)	14° 22' 00" N. 120° 34' 00" E.	WUAG	500	U.S. Army	600 spk.
Fort Mills WUP ..	14° 22' 52" N. 120° 34' 40" E.	WUP	500	U.S. Army	1,240 spk.
Fort Wint	14° 46' 15" N. 120° 13' 25" E.	WUAK	200	U.S. Army	600 spk.
Iloilo	10° 40' 00" N. 122° 30' 00" E.	KPM	450	Government	600, 950, 1,200, 1,600, 1,950, 2,400 spk.
Isabela de Dasilan	06° 40' 00" N. 121° 50' 50" E.	KPN	15	Government	200 spk.
Jolo	06° 10' 00" N. 121° 00' 00" E.	KIL	200	Government	600, 1,200, 1,905 spk.
Kindley Field	—	WYR	250	U.S. Army	1,500 c.w.
Lebak	06° 35' 00" N. 124° 05' 00" E.	KPX	125	Government	600, 900, 1,500, 2,000 spk.
Legaspi	13° 09' 00" N. 123° 45' 10" E.	KZAJ	100	Government	650, 500-1,100 c.w.
Malabang	07° 00' 00" N. 124° 05' 00" E.	KIZ	200	Government	600, 750, 800, 850 spk.
Malangas	07° 42' 00" N. 123° 05' 00" E.	KPV	150	Government	600 spk.
Malita	06° 22' 00" N. 125° 36' 00" E.	KPW	85	Government	450, 600, 700 spk.
Manila	14° 35' 48" N. 120° 58' 47" E.	WUAJ	1,000	U.S. Army	1,350 spk.
Mati	06° 57' 00" N. 126° 17' 00" E.	KPZ	90	Government	600, 952 spk.
Olongapo	14° 49' 00" N. 120° 16' 49" E.	NPT	150	U.S. Navy	600, 952, 1,910 spk.
Puerto Princessa ..	09° 40' 00" N. 118° 40' 40" E.	KIV	200	Government	600, 900 spk.
S. Francisco, Camotes	10° 38' 00" N. 124° 22' 00" E.	KPY	35	Government	378, 476, 756, 952 spk.
San Jose, Mindoro	12° 20' 30" N. 121° 00' 00" E.	KIY	150	Government	600, 1,400 spk.
S. Vincente	18° 26' 30" N. 122° 10' 00" E.	KZAG	100	Government	550-1,100, 750 c.w.
Siasi	5° 32' 45" N. 120° 49' 15" E.	KED	85	Government	450, 600, 650 spk.
Surigao	09° 48' 00" N. 125° 29' 00" E.	KZAM	100	Government	550-1,100, 950 c.w.
Virac	13° 35' 00" N. 124° 13' 45" E.	KZAH	35	Government	600, 750, 950 spk.
Zamboanga	06° 50' 00" N. 122° 03' 00" E.	KIW	175-450	Government	950, 1,250, 1,500, 1,850 spk.

POLAND					
Cracow	50° 03' 32" N. 19° 57' 34" E.	AXP	600	Government	1,900, 2,175, 2,500 c.w.
Grudziadz	53° 30' 00" N. 18° 45' 03" E.	AXK	1,500	Government	10,300 (Pr) c.w.
Posen	52° 24' 30" N. 16° 56' 25" E.	AXJ	1,100 1,300	Government	800, 1,800, 5,600 spk. 2,000, 4,700, 7,000, 10,000 c.w.
Warsaw Central ..	52° 15' 50" N. 20° 52' 37" E.	AXL AXM AXO	12,000 13,000 12,000	Government	18,000 altr. 3,700 arc 21,000 altr.
PORTO RICO					
Ceiba (T.)	18° 16' 00" N. 65° 39' 00" W.	WKK	150	Bureau of Insular Telegraph	300, 600, 1,610 c.w.
Ensenada	17° 58' 15" N. 66° 55' 50" W.	WPR	400	German Postal Service	300, 450, 600, 1,800 spk.
S. Juan, Porto Rico	18° 28' 03" N. 66° 05' 40" W.	NAU	300-1,000	U.S. Navy	600, 952, 2,100 2,855 (W), 3,950, 4,836 (W), 8,870, spk. & c.w.
Vieques (T.)	18° 09' 00" N. 65° 26' 33" W.	WGW	150	Bureau of Insular Telegraphs	300, 600, 1,610 c.w.
PORTUGAL AND COLONIES					
Lisboa Radio	38° 47' 11.1" N. 09° 23' 22.1" W.	PQL	190	Government	300, 450, 600 spk.
Lavadores (Oporto)	—	CTP	300 spk. 900 c.w.	—	300, 600 spk. 2,400 c.w.
Monsanto	38° 44' 00" N. 9° 11' 00" W.	CTV	—	—	600, 1,000 spk. 2,400 (W)
Oporto	41° 10' 35.7" N. 08° 42' 15.9" W.	PQP	400	Government	3,000 (W) c.w. 300, 600 spk.
AZORES					
Corvo	39° 40' 10" N. 31° 07' 35" W.	PQC	65	Government	300, 600 spk.
Faial	38° 38' 00" N. 28° 44' 10" W.	PQH	130	Government	300, 600 spk.
Flores	39° 27' 35" N. 31° 08' 10" W.	PQF	130	Government	300, 600 spk.
S. Maria	36° 59' 55" N. 25° 08' 20" W.	PQK	65	Government	300, 600 spk.
S. Miguel	37° 44' 30" N. 25° 42' 50" W.	PQM	65	Government	300, 600 spk.
Terceira Radio ..	38° 39' 55" N. 27° 07' 34" W.	PQT	400	Government	300, 600, 900, 1,000 spk.
CAPE VERDE ISLANDS					
Boa Vista, Sal Rei ..	16° 10' 00" N. 22° 56' 00" W.	CRJ	200	Government	300, 600, 1,000 spk.
Brava di C. Verde ..	14° 49' 55" N. 24° 45' 12" W.	CRGG	200	Government	300, 600, 800 spk.
Praia	14° 55' 00" N. 22° 30' 00" W.	CRK	400	Government	300, 600, 800, 1,000, 1,530 spk.
Sal, Sta Maria	16° 35' 00" N. 22° 55' 00" W.	CRI	200	Government	300, 600, 1,000 spk.
S. Filipe (Fogo) ..	14° 52' 12" N. 24° 31' 55" W.	CRFF	250	Government	300, 600, 1,000 spk.
S. Vicente de Cabo Verde	16° 52' 44" N. 24° 59' 10" W.	CRF	450	Government	300, 600, 1,000, (W). 1,500, 2,000, 3,000 spk.
PORTUGUESE EAST AFRICA (See under Mozambique)					
PORTUGUESE GUINEA					
Bissau	11° 51' 30" N. 15° 35' 10" W.	CRA	190 500	Government	300, 600, 1,000, 1,800, 2,000, 2,500, 3,000 spk.
Bolama	11° 36' 00" N. 15° 30' 00" W.	CRB	200	Government	300, 600, 800 spk.
RÉUNION					
St. Dennis-Réunion ..	20° 51' 38" S. 55° 27' 90" E.	HYO	1,500	Government	600, 1,500 2,400, 4,000 c.w.

ROUMANIA

(See note N)

Balcic	—	CVB	—	Navy	—
Baneasa (Bucharest)	—	CVOB	—	Government (Civil Aviation)	—
Bucharest, Herastrau	44° 25' N. approx. 26° 06' E. approx.	BUC	—	Radorama Co. ..	8,150 (W), 7,400 (Pr) 11,300 c.w. 8,200 c.w.
Bucharest	—	CVLA	1,250	—	—
Bucharest, Herastran	—	CVLE	—	Government	—
Bucharest	—	CVLM	—	Government	1,600, 1,800, 2,200 c.w. 800 c.w.
Bucharest	—	CVLF	—	Government	—
Bucharest (Buc. 9) (T)	—	CVME	320	—	—
Bucharest (No. 5)	—	CVNB	160	Government	1,400 c.w.
Bucharest	—	CVM	—	Navy	736 c.w. c.w.
(Marine Inspectorate)	—	—	—	—	—
Cerna-Voda	—	—	—	—	—
Cluj (T)	46° 47' N. approx. 23° 37' E. approx.	CVOC	320	Government (Civil Aviation)	1,400 c.w.
Constantza	44° 10' N. approx. 28° 40' E. approx.	CVLB	—	Government	—
Constantza	—	CVK	—	Navy	—
Constantza Tunnel ..	—	CVAA	160	—	800 spk.
Constantza Tunnel ..	44° 10' 32" N. 28° 39' 03" E.	CVAZ	240	State Maritime Service	300, 600 spk.
Cetatea-Albă	—	CVC	—	Navy	—
Galatz	45° 28' N. approx. 28° 04' E. approx.	CVLG	—	Government	—
Galatz (T)	—	CVNA	160	Government	736 c.w.
Galatz	—	CVG	160	Military and Navy ..	1,200 spk.
Oradia Mare (T) ..	47° 03' N. approx. 21° 56' E. approx.	CVLO	560	Government	1,800, 2,750 c.w.
Sulina T.S.F.	45° 10' N. approx. 29° 40' E. approx.	CVS	270	Military and Navy ..	1,500
Temisoara	45° 45' N. approx. 21° 14' E. approx.	CVLT	—	Government	3,310 c.w.
Turnu Severin	44° 38' N. approx. 22° 40' E. approx.	CVOS	—	Government (Civil Aviation)	—

RUSSIA

Anadyr	64° 34' 00" N. 175° 35' 00" E.	RCD	130	Government	300, 420, 600 spk.
Artemovsk	43° 34' N. appx. 38° 00' E. "	REN	450	Government	400, 2,500 spk.
Astrakhan	40° 21' N. appx. 48° 02' E. "	RAA	450	Government	1,400 spk.
Astrakan Radio ..	45° 15' 00" N. 47° 25' 00" E.	RCR	110	Government	300, 420, 600 spk.
Atbassar	58° 51' N. appx. 68° 02' E. "	RFM	600	—	1,500, 1,800, 2,500 spk.
Bakou	40° 22' N. appx. 49° 50' E. "	RAB	450	Government	1,400 spk.
Batoum	41° 36' 00" N. 41° 40' 00" E.	RCF	—	Government	—
Dickson	73° 30' 23" N. 88° 22' 48" E.	RFV	—	—	500-2,500 (W) 600 spk.
Dudinskoe	69° 24' 14" N. 86° 08' 50" E.	RFX	—	—	300, 600 spk
Ekaterinburg	56° 50' N. appx. 60° 39' E. "	REZ	800	Government	1,500, 2,500 3,000 c.w.
Eriwan	40° 10' 16.5" N. 44° 30' 10.9" E.	RDY	1,200	—	2,500 spk.
Ernak (Leningrad)	—	RBW	300	—	300, 600
Feodosia Port (T) ..	45° 01' 00" N. 35° 24' 00" E.	REK	200	Government	300, 900, 2,100, spk. & c.w.
Fort Ouritskogo ..	44° 30' 14" N. 50° 16' 40" E.	RCG	160	Government	300, 420, 600 spk.
Isakogorka (Archangel)	64° 27' 00" N. 40° 39' 00" E.	REA	400	Government	300, 600, 1,740, 1,900, 2,500 (W) spk.
Kanin Nos	68° 39' 20" N. 41° 18' 22" E.	REC	200	Government	300, 600 spk.
Kerbinskaia	52° 20' 07.3" N. 136° 29' 18" E.	RCH	70	Government	—
Kertch	45° 18' 00" N. 36° 27' 00" E.	RCI	—	Government	—

RUSSIA—*contd.*

Khabarovsk ..	48° 40' N. appx. 135° 05' E. "	RFN	1,200	—	1,500 (W), 4,000-6,000 c.w. 2,000 spk.
Kharkow ..	49° 58' N. appx. 36° 12' E. "	RAZ	1,500	Government ..	
Kiev ..	50° 30' N. appx. 30° 28' E. "	RAG	400	Government ..	1,500 c.w.
Kouchka ..	—	RAH	500	Government ..	1,500 spk.
Krasnovodsk ..	40° 00' 00" N. 52° 59' 00" E.	RDZ	250	Government ..	300, 600, 800, 3,000 spk.
Kronstadt ..	59° 59' 00" N. 29° 47' 00" E.	KRNS	—	Government ..	800-1,200
Kronstadt ..	59° 59' 00" N. 29° 47' 00" E.	RCJ	—	Government ..	360 spk.
Makhatch Kala ..	42° 59' 20" N. 47° 30' 00" E.	RCQ	160	—	300, 420, 600
Mare-Sale ..	69° 42' 59" N. 66° 48' 38" E.	RCK	150	Government ..	300, 420, 600 spk.
Matochkin Shar ..	73° 17' 15" N. 57° 18' 00" E.	RFU	700	Government ..	500-2,400 spk. 600, 2,000 (W)
Morjovets ..	66° 40' 00" N. 42° 30' 00" E.	REB	200	Government ..	300, 600 spk.
Moscow, Komintern (T)	55° 45' N. appx. 37° 37' E. "	RDW	1,800	Government ..	3,200 c.w.
Moscow, Mossovet ..	—	RAJ	2,500	Government ..	6,700 c.w.
Moscow, Oktiabrskaja	55° 47' N. appx. 37° 33' E. "	RAI	2,000	Government ..	4,880 (W) 5,000 spk.
Mourmansk ..	68° 56' 00" N. 33° 05' 00" E.	REE	350	Government ..	300, 600, 1,440 1,800 spk.
Nal'akhan ..	60° 33' 00" N. 159° 59' 00" E.	RCL	130	Government ..	300, 420, 600 spk.
Nicolaiew ..	—	RAK	1,800	Government ..	4,000 spk.
Novi Port ..	67° 23' 02" N. 72° 10' 00" E.	RFY	700	Government ..	500-1,500 spk. 600 (W)
Novo-Nicolaievsk ..	—	RAL	1,000	Government ..	3,000 c.w.
Novorossiisk ..	44° 46' 3.20" N. 37° 47' 19.70" E.	RDN	460	Government ..	300, 600, 1,100 spk.
Obdorsk ..	66° 31' 21" N. 66° 40' 00" E.	RAN	450	Government ..	900 (W) 1,400 spk.
Odessa ..	46° 29' 00" N. 30° 46' 00" E.	RDE	350	Government ..	600 spk.
Odessa Observatory	46° 28' 37.7" N. 30° 43' 53.9" E.	RDH	250	Government ..	1,200 spk.
Oikanga ..	67° 58' 00" N. 39° 38' 00" E.	RED	800	Government ..	300, 600, 1,500 spk.
Orenbourg ..	51° 46' N. appx. 55° 07' E. "	RAM	700	Government ..	3,000 spk.
Oulianovsk ..	—	RAR	—	—	—
Ourda ..	—	RES	250	Government ..	450, 950, 1,500 spk.
Oust Kamchatka ..	—	RFK	450	—	600-1,800 spk.
Oust-Syssolsk ..	61° 38' N. appx 50° 50' E. "	REG	250	—	1,000 spk.
Oust Yenesei ..	69° 39' 36" N. 84° 21' 45" E.	RFW	450	Government ..	300-1,200 spk. 600
Petropavlovsk ..	53° 00' 10" N. 158° 38' 45" E.	RCP	130	Government ..	300, 600, 2,000 (W) spk.
Petrovsk Daghestan	42° 59' 20" N. 47° 30' 00" E.	RCQ	160	Government ..	300, 420, 600 spk.
Petrozavodsk ..	61° 47' 18.9" N. 34° 23' 22.5" E.	RDI	200	Government ..	1,200 spk.
Podbelsky ..	Petrograd	RET	2,200	Government ..	7,000 c.w.
Poltava ..	49° 36' N. appx. 34° 35' E.	REO	150	Government ..	800, 1,500 spk.
Poti ..	42° 08' 30.5" N. 41° 39' 34.3" E.	RDX	450	Government ..	300, 600, 1,500 spk.
Priemny Lt. V. ..	60° 05' 00" N. 26° 30' 00" E.	RGJ	60	Government ..	350, 600, 900 spk.
Rostovdon ..	47° 15' N. appx. 39° 10' E. "	RAO	450	Government ..	1,400 spk.
Samara ..	50° 11' N. appx. 50° 09' E. "	RAQ	450	Government ..	1,500 spk.
Saratov ..	51° 35' N. appx. 46° 01' E.	RAP	600	Government ..	1,800 spk.
Sebastopol ..	44° 37' 00" N. 33° 33' 00" E.	RCT	—	Government ..	360.

RUSSIA—con'd.					
Semipalatinsk ..	50° 28' N. appx. 80° 13' E. "	RBC	200	Government ..	1,200 spk.
Simferopol ..	44° 58' N. appx. 34° 03' E. "	RAT	200	Government ..	1,400 spk.
Skadovskaia ..	33° 02' 00" N. 46° 07' 00" E.	RGM	200	Government ..	600 spk.
Smolensk ..	54° 50' N. appx. 32° 01' E. "	RAS	460	Government ..	1,400 spk.
Soukoum ..	Caucasus	RFO	—	—	Rec. only
Sredne-Kolymsk ..	67° 10' 14" N. 157° 09' 50" E.	RDG	800	Government ..	2,000 spk.
Staraja Boukhara ..	39° 46' 37.32" N. 64° 25' 52.87" E.	RDJ	200	Government ..	800 spk.
Sverdlovsk ..	—	REZ	800	Government ..	1,500, 2,500, 3,000 c.w.
Sviatogor ..	59° 56' 00" N. 30° 17' 00" E.	RDB	350	Government ..	600 spk.
Tachkent ..	41° 30' N. appx. 69° 20' E.	RAU	1,500	Government ..	4,000 spk.
Taganrog Radio ..	46° 59' 50" N. 38° 14' 10" E.	RCS	110	Government ..	300, 420, 600 spk.
Tchita ..	53° 10' N. appx. 113° 40' E.	RDV	1,200	—	2,500 spk.
Tiflis ..	41° 41' 59" N. 44° 48' 16" E.	RDK	1,000	Government ..	2,500 spk.
Timme ..	60° 32' 00" N. 40° 30' 00" E.	RGE	300	Government ..	600, 1,800 spk.
Touapse ..	44° 10' N. appx. 38° 59' E. "	RAW	200	Government ..	1,200 spk.
Ts heliabinsk ..	—	RBB	1,000	Government ..	3,000 spk.
Tsyp-Navolok ..	68° 56' 00" N. 33° 05' 00" E.	REF	200	Government ..	300, 600, 900 spk.
Tver (reception only)	56° 52' N. appx. 35° 48' E. "	RCC	200	Government ..	1,200 (Rec)
Tzaritzyn ..	48° 47' N. appx. 44° 25' E.	RBA	450	Government ..	1,500 spk.
Vaigatch ..	70° 23' 46" N. 58° 48' 00" E.	RCU	150	Government ..	300, 420, 600 spk.
Viatka ..	58° 00' N. appx. 49° 00' E. "	RAE	300	Government ..	1,200 spk.
Vladikavkaz ..	40° 01' N. appx. 44° 42' E.	RAF	200	Goverment ..	1,200 spk.
Vladivostok RCV ..	43° 06' 00" N. 131° 54' 00" E.	RCV	—	Government ..	1,200 1,500 (W) spk.
Vladivostok RCW	43° 06' 49.2" N. 131° 53' 22.5" E.	RCW	—	Government ..	360
Yougorski-Char ..	60° 49' 07" N. 60° 45' 42" E.	RCX	150	Government ..	300, 420, 600 1,800 (W) spk.
SAINT LUCIA. (See under British West Ind. Is.)					
SAINT PIERRE AND MIQUELON ISLANDS					
S. Pierre Island ..	46° 46' 39" N. 56° 10' 57" W.	HYS	Day 600 Ngt. 1,500	Government ..	500, 600, 1,100 spk.
Miquelon ..	47° 07' 00" N. 56° 24' 00" W.	HYT	Day 80	Government ..	600 c.w.
S. THOMAS and PRINCE'S ISLANDS					
S. Thomé ..	00° 20' 49" N. 6° 44' 42" E.	CRD	750	Portuguese Govern- ment	300, 600, 900, 1,000, 1,500 spk.
SALVADOR					
Venustiano Carranza	13° 40' N. appx. 89° 12' W. "	SDA	—	Government ..	—
SAMOA ISLANDS					
Apia Radio ..	13° 50' 17" S. 171° 49' 42" W.	VMG	500	New Zealand Adminis- tration	300, 600, 2,000 (W) spk.
Ofu ..	14° 11' 30" S. 169° 40' 50" W.	NGX	—	U.S. Navy ..	600, 705 spk.
Tau ..	14° 15' 00" S. 169° 33' 15" W.	NCM	—	U.S. Navy ..	300, 450, 600
Tutuila ..	14° 16' 30" S. 170° 42' 00" W.	NPU	300-2,300	U.S. Navy ..	600, 952, 2,100, 2,254 (W.), 3,850, 4,543, spk. & c.w.

SARAWAK. (See under British North Borneo.)					
SERBS, CROATS AND SLOVENES (KINGDOM OF). Belgrade (Banjitz)	44° 47' 57" N. 20° 21' 57.5" E.	HFB	645	Radio Slavia Co.	3,800, 4,500, 4,600 (W), 4,700, 6,800, 7,000 8,000 c.w.
Belgrade (Rakoritz)	44° 44' 50" N. 20° 27' 00" E.	HFD HFE HFF	1,600	Radio Slavia Co.	11,150, 10,900, 1,650-1,900 c.w.
Herzegovina	42° 27' 00" N. 18° 32' 14" E.	UNK	400	—	800, 1,800 spk.
Pancsova (T.) ..	44° 00' 00" N. 21° 00' 00" E.	UNBB	160	—	1,000 c.w.
Sarajevo	43° 51' 00" N. 18° 26' 00" E.	HFC	645	—	2,600 6,000 c.w.
Sibenik	43° 43' 30" N. 15° 54' 12" E.	UNS	265	—	600, 1,200 spk.
Skoplje	42° 00' 18" N. 21° 25' 30" E.	HFS	—	—	2,500 4,000 c.w.
SIAM					
Bangkok	13° 44' 30" N. 100° 32' 00" E.	HGA	Day 300 Night 600	Government ..	300, 600, 1,600, 1,800 spk.
Kohkham	13° 10' 00" N. 100° 48' 00" E.	HGK	80	—	300, 600 c.w.
Red Light Ship I ..	13° 27' 00" N. 100° 33' 40" E.	HGR	50	—	300, 600 spk.
Singora	07° 12' 00" N. 100° 38' 00" E.	HGB	Day 300 Night 600	Government ..	300, 600, 1,600, 1,800 spk.
SIBERIA. (See under Russia.)					
SIERRA LEONE Sierra Leone	08° 29' 48" N. 13° 13' 55" W.	VPU	250	—	300, 600 spk.
SOLOMON ISLANDS. (See under New Guinea.)					
SOUTH AFRICA (UNION OF)					
Capetown Radio ..	34° 08' 45.90" S. 18° 19' 17.51" E.	VNC	350	Government ..	300, 600 (WT) spk.
Dassen Island Radio	33° 26' 00" S. 18° 05' 00" E.	VNF	45	Government ..	600 spk.
Durban Radio ..	29° 49' 15" S. 31° 01' 20" E.	VND	250	Government ..	300, 600 (W.) spk.
East London Radio	33° 01' 45" S. 27° 54' 59" E.	VNO	60	Government ..	300, 600 spk.
Jacobs Natal Radio	29° 55' 40" S. 30° 58' 50" E.	VNI	—	Government ..	—
Port Elizabeth Radio	33° 57' 16" S. 25° 35' 30" E.	VNQ	300	Government ..	300, 600 (W) 1,200 spk.
Port Nolloth Radio	29° 14' 00" S. 16° 52' 00" E.	VNJ	—	Government ..	2,000
Table Bay Radio ..	33° 54' 00" S. 18° 25' 30" E.	VNN	12	Government ..	600 spk.
BRITISH SOUTH-WEST AFRICA					
Walvis Bay Radio	22° 57' 53" S. 14° 30' 08" E.	VNV	Day 1,250 Ngt. 2,500	Government ..	300, 600 (W) 900, 1,600, 2,000 spk.
SPAIN (and BALEARIC ISDS.) (See note O)					
Alcazares (Los) (T)	37° 44' 20" N. 00° 51' 17" W.	ECLD	300 Morse 110 t'py.	Royal Aircraft Service	600, 900, 1,200, 1,500 c.w.
Almeria	36° 51' 00" N. 02° 31' 15" W.	EGA	220	Army	600, 900, 1,200 spk.
Anjuez	40° 01' 48" N. 03° 04' 32" W.	FAA	430	Compania Nacional de Telegrafia sin Hilos	300, 600, 2,130 spk

SPAIN—contd.

Barcelona	41° 23' 08" N. 02° 03' 52" E.	EGE	430	Army	600, 1,000, 1,600 spk.
Barcelona Radio ..	41° 18' 42" N. 02° 06' 28" E.	EAB	430	Compania Nacional de Telegrafia sin Hilos	300, 600, 2,300 spk.
Bilbao	43° 23' 53" N. 02° 55' 34" W.	EGH	320	Army	600, 900, 1,200, 1,500 (W) 1,600 spk.
Cabo de Palos ..	37° 38' 00" N. 00° 40' 00" W.	EAP	200	Compania Nacional de Telegrafia sin Hilos	300, 600, 1,800 spk.
Cabo Finisterre ..	42° 52' 56" N. 09° 16' 20" W.	EAF	210	Compania Nacional de Telegrafia sin Hilos	300, 600, 1,800 spk.
Cabo Mayor	43° 30' 00" N. 03° 48' 30" W.	EAS	110	Compania Nacional de Telegrafia sin Hilos	300, 600, 1,800 spk.
Cadiz	36° 31' 30" N. 06° 17' 42" W.	—	6	Cie Transatlantique Espagnole	70 spk.
Cadiz Radio	36° 29' 45" N. 06° 16' 14" W.	EAC	860	Compania Nacional de Telegrafia sin Hilos, Madrid	300, 600, 2,540 spk.
Carraca (La)	36° 29' 30" N. 06° 10' 50" W.	CLZ	60	Navy	300, 600, 1,200 spk.
Cartagena	37° 35' 36" N. 00° 51' 18" W.	EBX	210	Navy	600, 900, 1,000, 1,200, 1,600 spk.
Coruña	43° 24' 29" N. 08° 24' 13" W.	EGJ	430	Army	600, 1,200, 1,500 (W) 1,600 spk.
Cuatro Vientos (T)	40° 22' 30" N. 03° 46' 27" W.	ECLA	450 Morse 200 t'py.	Royal Aircraft Service	600, 900, 1,200, 1,500 c.w.
Ferrol (Le)	43° 28' 52" N. 08° 14' 05" W.	EBW	440	Navy	600, 900, 1,200, 1,600, 1,800 spk.
Ferrol-Caranza D.F.	43° 29' 04" N. 8° 13' 06" W.	EBAW	—	—	450
Getafe (T)	40° 18' 15" N. 03° 43' 24" W.	ECLC	120 Morse 50 t'py.	Royal Aircraft Service	600, 900 c.w.
Granada (T)	37° 11' 00" N. 3° 38' 00" W.	ECLF	300 Morse 110 t'py.	Royal Aircraft Service	600, 900, 1,500 (W.) c.w.
Guadalajara (T) ..	40° 37' 54" N. 03° 10' 09" W.	EGZ	400 Morse 200 t'py.	Army	900, 1,200 c.w.
Madrid EBZ	40° 25' 00" N. 03° 43' 00" W.	EBZ	15	Navy	225, 300 spk.
Madrid EGC	40° 24' 30" N. 03° 50' 30" W.	EGC	6,250	Army	3,500, 4,445, 10,000, 13,335 altr. 1,500, 2,650, 2,800, 3,500 c.w.
			1,250		600, 900, 1,000, 1,200, 1,500, 1,800, 2,100 (W) spk.
			600		1,500, 2,650, 2,800, 3,500 t'py.
Madrid (Military Aircraft D.F.)	40° 25' 30" N. 03° 41' 18" W.	ECLB	25	Royal Aircraft Service	600, 700, 800
Madrid Cuidad Lineal		CLR	600	Navy	900, 2,000
Mahon CLM	39° 51' 37" N. 04° 22' 38" E.	CLM	300	Navy	600, 900, 1,800 spk.
Mahon EGI	39° 52' 29" N. 04° 22' 39" E.	EGI	400	Army	600, 900, 1,200, 1,500 (W.) spk.
Malaga (T)	36° 42' 51" N. 05° 23' 37" W.	EGM	300 spk. 250 c.w. 100 t'py.	Army	900, 1,200 (W), 1,500, 2,100 spk. & c.w.
Matagorda	36° 31' 30" N. 06° 14' 54" W.	—	6	Cie Transatlantique Espagnole	70 spk.
Ministry of War ..	40° 25' 13" N. 03° 41' 42" W.	EGY	80	Army	900, 1,200 spk.
Palmas Radio (Las) (Canary Islands)	28° 00' 00" N. 15° 22' 00" W.	EAL	860	Compania Nacional de Telegrafia sin Hilos, Madrid	300, 600, 2,540 spk.
Peñon de Velez de la Gomera (T)	35° 10' 30" N. 04° 18' 00" W.	EGP	320 Morse 200 t'py.	Army	900, 1,200 c.w.
Seville	37° 21' 50" N. 06° 00' 47" W.	ECLE	300 Morse 110 t'py.	Army	600, 900, 1,200, 1,500 (W) c.w.
Soller Radio (Majorca)	39° 45' 15" N. 02° 45' 40" E.	EAO	270	Compania Nacional de Telegrafia sin Hilos, Madrid	300, 600 spk.
S. Fernando, Cadiz ..	—	EBY	—	—	1,500 (W) spk.
Teneriffe Radio ..	28° 28' 30" N. 16° 15' 00" W.	EAT	860	Compania Nacional de Telegrafia sin Hilos, Madrid	300, 600, 1,500 (W), 2,100, 2,540 spk.
Teneriffe D.F.	28° 27' 30" N. 16° 14' 39" W.	EAT	860	—	600, 1,500 spk.

SPAIN - <i>contd.</i>					
Valencia	39° 27' 10" N. 00° 22' 46" W.	EGG	320	Army	600, 900, 1,200, 1,500 (W) spk.
Vigo	42° 15' 00" N. 08° 40' 00" W.	EAV	430	Compania Nacional de Telegrafia sin Hilos, Madrid	300, 600, 2,900 spk.
(b) COLONIES					
(MOROCCO, &c.)					
Alhucemas (Morocco)	35° 13' 00" N. 03° 30' 00" W.	EGO	250	Army	900, 1,200 spk.
Cabo Juby (Morocco)	27° 56' 00" N. 13° 06' 30" W.	EGL	300 spk. 600 c.w.	Army	900, 1,200, 1,500 spk. & c.w.
Ceuta (Morocco) ..	35° 48' 40" N. 05° 16' 24" W.	EGD	320	Army	600, 1,200, 1,500, 2,100 spk.
Larache (Morocco) (T)	35° 12' 00" N. 06° 12' 00" W.	EGF	375 spk. 320 c.w. 150 t'py.	Army	900, 1,200 (W) 2,100, 1,500 spk. & c.w.
Melilla (Morocco) (T)	35° 18' 15" N. 02° 56' 25" W.	EGB	375 spk. 600 c.w. 320 t'py.	Army	600, 1,200, 1,500 (W), 2,100 spk. & c.w.
Nador (Melilla) (T) ..	35° 13' N. appx. 02° 56' W.	ECLG	300 Morse 110 t'py.	Royal Aircraft Service	600, 900 c.w.
Santa Isabel de Fer- nando Póo	03° 46' 00" N. 08° 48' 40" E.	EAY	130	Government	300, 600, 1,800 spk.
Tetuán (Morocco) ..	35° 33' 30" N. 05° 22' 30" W.	EGK	350 spk. 600 c.w. 320 t'py.	Army	900, 1,200, 1,500 (W), spk. & c.w.
Villa Cisneros (Rio de Oro)	23° 40' 43.4 N. 15° 54' 03.5 W.	EGN	400	Army	600, 900, 1,200, 1,600 spk.
STRAITS SETTLEMENTS					
Penang Radio	05° 32' 03.12" N. 100° 22' 51.14 E.	VPX	Day 350 Night 700, 1,200	Government	600, 1,030 spk. 2,225 c.w.
Seletar, Singapore ..	01° 23' 27.53" N. 103° 51' 49.24" E.	BXW	—	Navy	5,000 c.w.
Singapore Radio	01° 20' 25.6" N. 103° 53' 25.26" E.	VPW	Day 350 Night 700	Government	600, 1,800 spk.
CHRISTMAS ISLD.					
Christmas Island ..	10° 25' 19" S. 105° 42' 57" E.	VSM	Day 800 Ngt. 1,500	The Christmas Island Phosphate Company	1,800, 2,200, 3,200, 3,400, 3,700 c.w.
COCOS - KEELING ISLANDS					
Cocos	12° 05' 24" S. 96° 53' 20" E.	VPK	150	Marconi International Marine Communi a- tion Co. and Eastern Extension Australa- sia and China Telegraph Co.	300, 600 spk.
SUDAN. (See under Egypt.)					
SWEDEN					
(See note P)					
Boden Radio	65° 50' 40" N. 21° 38' 56" E.	SAI	200	State Telegraphs ..	300, 600 spk.
Flottans Stns.	Stockholm	SAD	—	Navy	—
Göteborg Radio	57° 40' 44" N. 11° 54' 00" E.	SAB	350	State Telegraphs ..	300, 600 spk.
Gottland Radio	57° 43' 4" N. 18° 35' 50" E.	SAE	420	Marine Department ..	300, 600 spk.
Grundkallen Lightship	60° 29' 50" N. 18° 54' 30" E.	SAK	55	State Telegraphs ..	300, 450, 600 spk.
Halö D.F.	58° 20' 08" N. 11° 13' 04" E.	SAM	—	State Telegraphs ..	600 (Rec.)
Härnösand Radio	62° 44' 17" N. 18° 07' 47" E.	SAH	350	State Telegraphs ..	300, 600 spk.
Karlsborg Radio	58° 29' 18" N. 14° 28' 44" E.	SAJ	—	—	2,500 (W), 4,000, 4,200 spk. & c.w.
Karlskrona Radio	56° 09' 09" N. 15° 35' 23" E.	SAA	420	Marine Department ..	300, 600 spk.
Ölandsrev Lightship	56° 07' 00" N. 16° 34' 00" E.	SAG	55	State Telegraphs ..	300, 450, spk.
Trällebörg Radio	55° 22' 13" N. 13° 09' 46" E.	SAC	250	State Railways	300, 8 5, 600 spk.
Vaxholm Radio	59° 24' 15" N. 18° 21' 50" E.	SAF	350	State Telegraphs ..	300, 600 spk.
Vinga, Swed D.F.	57° 37' 58" N. 11° 36' 09" E.	SAL	—	State Telegraphs ..	600 (Rec.)

SWITZERLAND

Berne	47° 00' 52" N. 07° 26' 37" E.	HBA HBB	—	Marconi Radio Station S.A.	5,140 c.w. 3,400 c.w.
Geneve-Cointrin (T)	46° 13' 45" N. 06° 06' 04" E.	HB 1	—	—	1,400, 1,600, 900, 1,200 c.w. & t'py.
Höngg (Zurich) T	47° 24' 28" N. 08° 30' 24" E.	HBH	—	Post and Telegraphs Dept.	515 t'py.
Kloten (Dubendorf)	47° 27' 43" N. 08° 34' 50" E.	HBK	—	Army	700, 1,400, 1,980 (W) c.w.
Lausanne-Champ-de L'Air (T)	46° 31' 25" N. 06° 38' 26" E.	HB 2	—	—	1,400, 900, 1,100 (W) c.w. & t'py.

SYRIA

Beyrouth T.S.F. ..	33° 46' 00" N. 35° 28' 00" E.	FFD	200	Soc. Radio-Orient ..	300 600, spk.
Beyrouth	—	UFZ	1,600	Soc. Radio-Orient ..	10,300 altr.
Beyrouth-Djedeide ..	33° 54' 09" N. 35° 32' 45" E.	FUL	1,200	—	6,100 (W) c.w.
Raz-Beyrouth ..	33° 54' 00" N. 35° 30' 00" E.	FLZ	600	—	600-800 spk.

TIMOR (PORTUGUESE)

Dili	08° 33' 00" S. 125° 35' 40" E.	CRE	500	—	200, 300, 800 spk.
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TONGA ISLANDS
(See under Pacific Islands)**TRINIDAD.** (See under British West Indies)**TRIPOLITANA AND CYRENAICA**

TRIPOLITANA					
Trik Gefara	32° 52' 28" N. 13° 23' 47" E.	IDW	50	Government	300, 600 spk.
Tripoli Radio ..	32° 52' 40" N. 13° 11' 40" E.	ICK	160, 300	Government	300, 600 spk.
CYRENAICA					
Bengasi Radio ..	32° 06' 14" N. 20° 03' 15" E.	ICJ	300 160-300	Government	2,400 c.w. 300, 600 spk.
Cirene Radio ..	32° 48' 40" N. 21° 48' 00" E.	IDN	120	Government	300, 600 spk.
Derna Radio ..	32° 44' 54" N. 22° 39' 46" E.	ICO	270	Government	300, 600 spk.
Taukra	32° 30' 10" N. 20° 33' 35" E.	IDN	120	—	600
Tobruch Radio ..	32° 03' 30" N. 24° 00' 00" E.	ICU	270	Government	300, 600 spk.

TUNIS

(See note Q)					
Bizerte-Carouba ..	37° 14' 24" N. 09° 49' 40" E.	FUB	200	—	600-800 spk.
Bizerte-Carouba (Aviation)	—	FUB	—	—	—
Bizerte-Setié-Meriem	37° 14' 50.9" N. 09° 50' 08.2" E.	FFW	300	French Navy ..	300, 600, (W) 800 spk.
Bizerte-Sidi-Abdallah	37° 09' 38.6" N. 09° 48' 18" E.	FUA	800 1,200	French Navy ..	1,350 spk.
Setié-Meriem D.F. ..	37° 14' 42.5" N. 09° 50' 02.8" E.	FEQ	—	French Navy ..	5,150 (W) c.w. 450, 600, 800
Tunis Aerodrome (T)	—	Tunis	—	French Aeronautical Dept.	600, 900, 1,400 c.w. & t'py.
Tunis Hydraviation (T)	—	FNU Tunis	—	French Aeronautical Dept.	600, 900, 1,400 c.w. & t'py.

TURKS and CAICOS ISLANDS. (See under British West Indies)

UNITED STATES OF AMERICA

(See note R)

Aberdeen (Washington)	40° 59' 00" N. 123° 50' 00" W.	KZE	300	Grays Harbour Steve- dore Co.	300, 550, 600, 1,641 spk.
Allentown, Pa. (T) ..	40° 35' 00" N. 75° 28' 00" W.	WHC	50	Pennsylvania Power & Light Co.	135 c.w.
Alpena, Mich. ..	45° 05' 00" N. 83° 30' 00" W.	WNO	200	Huron Transportation Co.	300, 600, 750, 1,790 c.w.
Amagansett, N.Y. D.T.	40° 58' 10" N. 72° 07' 27" W.	NBM	100	U.S. Navy	800
Anacostia, D.C. ..	38° 52' 21" N. 77° 00' 11" W.	NSF	200	U.S. Navy	545 c.w.
Anacostia D.F. ..	38° 51' 26" N.	NSF	100	U.S. Navy	800 spk.
Annapolis NAK (Naval Academy)	38° 59' 00" N. 76° 27' 00" W.	NAK	150	U.S. Navy	600, 952, 1,540 spk.
Annapolis NZO (Laboratory)	—	NZO	—	U.S. Navy	Variable
Avalon (California)	33° 20' 45" N. 118° 19' 30" W.	KFRD	25	L. C. Dent	1,613 c.w.
Baltimore WEQ (T) (Maryland)	—	WEQ	150	Fire Commissioners ..	731, 909 c.w.
Baltimore WLL ..	Maryland	WLL	200	City of Baltimore ..	300, 600, 706 spk.
Bar Harbor NBD (Maine)	44° 14' 15" N. 68° 18' 00" W.	NBD	300, 1,000	U.S. Navy	600, 952, 2,100, 2,342, 2,400 (Pr.), 3,700, 3,950 spk. & c.w.
Bar Harbor D.F. ..	44° 18' 49" N. 68° 11' 40" W.	NQC	100	U.S. Navy	800 spk. & c.w.
Barnegat (New Jersey)	39° 33' 00" N. 74° 23' 00" W.	WCI	4,000	Radio Corporation of America	300, 600, 16,700 c.w.
Baytown (Texas) ..	29° 44' 20" N. 95° 00' 30" W.	KDPS	200	Humble Oil & Refining Co.	300, 600, 706 spk. & c.w.
Beaumont (Texas) ..	30° 08' 00" N. 93° 58' 00" W.	WOD	250	Magnolia Petroleum Co.	300, 600, 706 spk.
Belfast (Maine) ..	44° 24' 50" N. 69° 00' 00" W.	WGU	200	R.C. of A.	1,610 c.w.
Belfast (Maine) ..	—	WIR	200	R.C. of A.	1,750 c.w.
Bellefonte	Pennsylvania	WWQ	250	Post Office	3,446, 3,998 (Rec.)
Bellevue	Dist. of Columbia	NKF	—	U.S. Navy	—
Benton Harbour (Mich.)	42° 06' 50" N. 86° 28' 42" W.	WIZ	200	Graham & Morton Transportation Co.	300, 600, 706 spk.
Bethany Beach D.F. (Delaware)	38° 32' 45" N. 75° 03' 22" W.	NSD	100	U.S. Navy	800
Big Creek (T) (California)	37° 16' 00" N. 118° 58' 00" W.	KRY	75	Southern California Edison Co.	1,585, 1,630, 1,685 c.w.
Big Creek Power House No. 3	37° 09' 00" N. 119° 23' 00" W.	KEP	200	Southern California Edison Co.	1,585, 1,630, 1,685 c.w.
Bird Island D.F. (California)	37° 49' 27" N. 122° 32' 12" W.	NLD	100	U.S. Navy	800
Birmingham ..	Alabama	WPM	500	Inland & Coastwise Waterways Co.	300, 600, 1,100, 1,800 spk.
Bolinas KET ..	37° 54' 30" N. 122° 40' 45" W.	KET	4,000	Radio Corporation of America	13, 345 c.w.
Bolinas KPH	37° 54' 12" N. 122° 42' 30" W.	KPH	300	R.C. of A. (Controlled from S. Francisco, KPH)	300, 600, 2,200 spk. & c.w.
Bolling Field (Anacostia D.C.)	—	WYB	250	U.S. Army	1,500 c.w.
Boston NAD, (Massachusetts)	42° 23' 26" N. 71° 03' 01" W.	NAD	300-1,000	U.S. Navy	600, 952, 1,363 (W/T) spk. & c.w.
Boston WBF ..	42° 21' 19" N. 71° 03' 40" W.	WBF	500	Tropical Radio Tele- graph Company	300, 600, 690, 2,000, 2,175 c.w.
Boston WEY (T) ..	42° 21' 30" N. 71° 03' 51" W.	WEY	10	Boston Fire Dept. ..	146, 300, 600 c.w.
Boston WVO ..	42° 21' 19" N. 71° 03' 40" W.	WVO	50	U.S. Army	669 c.w.
Bowling Green (T) (Kentucky)	36° 59' 00" N. 86° 20' 00" W.	WJAV	300	Indian Pipe Line Cor- poration	1,790 c.w.
Brownsville (Texas)	25° 52' 00" N. 97° 26' 00" W.	NAY	300-600	U.S. Navy	600, 952, 2,254, (W), 3,950, 4,997 (W), spk. & c.w.
Bryan (Ohio) ..	41° 27' N. appx. 84° 33' W. "	KDEL	—	Post Office	3,295, 3,998 (Rec)

UNITED STATES OF
AMERICA—*contd.*

Buffalo WAM ..	42° 53' 00" N	WAM	200	Inter City Radio Tele-	300, 600 1,764
(New York State)	75° 55' 00" W.			graph Co.	spk.
Burrwood, Louisiana	28° 57' 47" N.	WBW	—	Tropical Radio Tele-	300, 600, 1,713
	89° 22' 57" W.			graph Co., Boston	spk.
Butler (T)	40° 10' 00" N.	WBR	100	Pennsylvania State	289, 1,599 c.w.
(Pennsylvania)	79° 00' 00" W.			Police	
Camp 60 (T)	37° 15' 00" N.	KDPV	50	Southern California	1,585, 1,630.
(California)	119° 09' 00" W.			Edison Company	1,685 c.w.
Camp 61 C (T)	37° 18' 30" N.	KFM	50	Southern California	1,585, 1,630.
(California)	119° 05' 00" W.			Edison Company	1,685 c.w.
Camp 61 (T)	37° 18' 30" N.	KDPW	50	Southern California	1,585, 1,630.
(California)	119° 05' 00" W.			Edison Company	1,685 c.w.
Camp Alfred Vail ..	New Jersey	WUBA	300	U.S. Army ..	1,100 c.w.
Camp Harry J. Jones	Arizona	WZM	50	U.S. Army ..	1,347 c.w.
Camp Knox ..	Kentucky	WUBC	200	U.S. Army ..	1,091 spk.
Camp Marfa ..	Texas	WUG	1,000	U.S. Army ..	3,800 spk.
Camp S. D. Little ..	Arizona	WZL	50	U.S. Army ..	1,347 c.w.
Cape Elizabeth D.F.	43° 33' 59" N.	NAB	100	U.S. Navy ..	800, 1,090
(Portland Maine)	70° 11' 59" W.				
Cape Hatteras ..	35° 15' 58" N.	NDW	150	U.S. Navy ..	600, 952,
	75° 31' 21" W.				1,807 spk.
Cape Hatteras D.F.	35° 14' 22" N.	NDW	100	U.S. Navy ..	800
(North Carolina)	75° 31' 42" W.				
Cape Henlopen D.F.	38° 47' 35" N.	NSD	100	U.S. Navy ..	800
(Delaware)	75° 05' 26" W.				
Cape Henry Light	36° 55' 35" N.	—	—		1,000 (Bea) c.w.
Station (Virginia)	76° 00' 27" W.				
Cape Lookout D.F.,	34° 36' 11" N.	NAN	100	U.S. Navy ..	800
(North Carolina)	76° 32' 18" W.				
Cape May D.F.	38° 55' 53" N.	NSD	100	U.S. Navy ..	800
(New Jersey)	74° 54' 35" W.				
Cascade (T)	37° 12' 00" N.	KDPU	200	Southern California	1,585, 1,630.
(California)	119° 14' 00" W.			Edison Company	1,685 c.w.
Casper (T)	42° 52' 00" N.	KDC	200	Illinois Pipe Line Co.	1,689 c.w.
(Wyoming)	106° 20' 00" W.				
Cattle Point ¹ D.F.	48° 27' 04" N.	NFN	100	U.S. Navy ..	800
(Washington)	122° 57' 45" W.				
Cedar Falls (T)	47° 25' 00" N.	KFR	100	City of Seattle Light-	1,934 c.w.
(Washington)	121° 48' 00" W.			ing Dept.	
Chanute Field	Illinois	WYJ	250	U.S. Army ..	1,500, 1,557 c.w.
Charleston (South	32° 51' 36" N.	NAO	300-1,000	U.S. Navy ..	600, 952, 2,100 (W)
Carolina)	79° 57' 49" W.				2,007, 3,950, 4,797
					spk. & c.w.
Chatham	41° 42' 11" N.	WIM	350	R. C. of A. ..	300, 600, 735
(Massachusetts)	69° 58' 56" W.				c.w.
Cheboygan (Michigan)	45° 00' 00" N.	KUXM	100	Warren W. Katham ..	300, 600, 1,599
	85° 00' 00" W.				c.w.
Cheyenne	—	KDEG	250	Post Office ..	3,123, 3,998
(Wyoming)				(Rec.)	
Chicago WBU (T)	41° 52' 26" N.	WBU	200	City of Chicago ..	420 c.w.
(Illinois)	87° 37' 20" W.				
Chicago WGN ..	—	WGN	—	—	370 (W) t'py.
Chicago WGO ..	41° 52' 26" N.	WGO	200	Radio Corporation of	300, 600, 706,
	87° 37' 20" W.			America	890 (W),
					1,800 spk. & c.w.
Chicago WVT ..	Illinois	WVT	250	U.S. Army ..	1,303 c.w.
Clearwater KNR ..	33° 53' 45" N.	KNR	1,000	Federal Telegraph Co.	3,332, 3,830,
	118° 09' 40" W.				5,416 c.w.
Clearwater KOK	33° 53' 45" N.	KOK	500	Federal Telegraph Co.	300, 600, 706,
(California)	118° 09' 40" W.				1,800 spk. & c.w.
Cleveland KDPM (T)	41° 29' 31" N.	KDPM	100	Westinghouse Electric	300, 600,
(Ohio)	81° 43' 37" W.			& Mfg. Co.	1,817 c.w.
Cleveland WJAX (T)	—	WJAX	—	—	390 (W) t'py.
Cleveland WTK	40° 30' 00" N.	WTK	300	Inter-City Radio Tele-	300, 600, 706 (W)
(Ohio)	81° 43' 30" W.			graph Co.	1,764, 1,800
Cleveland WWO ..	Ohio	WWO	—	Post Office ..	spk. & c.w.
					3,795, 3,998
				(Rec.)	
Coram Hill	40° 55' 45" N.	WQL	4,000	Radio Corporation of	17,500 c.w.
(New York State)	72° 56' 30" W.			America	
Cranston (T) ..	Rhode Island	WKAP	—	—	300, 475, 600
Crescent City (T)	41° 44' 40" N.	WWEJ	10	U.S. Army ..	—
(California)	124° 12' 08" W.				
Culver City KYI	California	KYI	25	Metro Pictures Cor-	146
(Portable) (T)				poration	

UNITED STATES OF AMERICA— <i>contd.</i>					
Culver City KYJ (Portable) (T)	California	KYJ	25	Metro Pictures Corporation	146
Culver City KZY (T)	California	KZY	50	T. H. Ince	146, 300, 600 c.w.
Dahlgren	Virginia	NDY	—	U.S. Navy	Variable
Dallas (Texas) ..	32° 47' 00" N. 96° 48' 00" W.	WFAA	150	Dallas News	925 c.w.
Davenport (T) (Iowa)	41° 30' 00" N. 90° 38' 00" W.	WOC	150	Palmer School of Chiropractic	674 c.w.
Dearborn (T) (Michigan)	42° 18' 00" N. 83° 14' 00" W.	WAV	100	Henry Ford	300, 600, 1,713 1,875 c.w.
Deer Island D.F. ..	42° 21' 16" N. 70° 57' 29" W.	NWM	100	U.S. Navy	800
Detour Point D.F. (Michigan)	45° 57' 20" N. 83° 54' 54" W.	NZU	100	U.S. Navy	600 (W), 800 (D F)
Detroit KDPH (T) (Michigan)	42° 20' 05" N. 83° 03' 40" W.	KDPH	150	Detroit Edison Co. ..	1,621 c.w.
Detroit WWJ	42° 19' 40" N. 83° 15' 00" W.	WWJ	150	Evening News Assoc.	300, 600, 750 c.w.
Dillard (Oklahoma)	34° 10' 16" N. 97° 19' 00" W.	KZR	200	Skelly Oil Co. ..	1,578, 1,599 c.w.
Duluth	Minnesota	WME	500	Inter-City Radio Tele- graph Co.	300, 600, 1,800 spk.
Duluth Range Rear Light Stn.	46° 46' 44" N. 92° 05' 30" W.	WWEB	500	Bureau of Lighthouses	145 c.w.
Eagle Harbor D.F. (Michigan)	47° 27' 33" N. 88° 08' 43" W.	NUG	100	U.S. Navy	600 (W), 800 (D F)
East Hampton (New York)	40° 57' 28" N. 72° 12' 33" W.	WSA	900	Independent Wireless Telegraph Co.	300, 600, 625 spk.
East Moriches (New York State)	40° 46' 00" N. 72° 46' 05" W.	WSH	150	Independent Wireless Telegraph Co.	600 spk.
East Pittsburgh (Pennsylvania)	40° 24' 00" N. 79° 50' 00" W.	KDKA	300	Westinghouse Electric & Mfg. Co.	1,817 c.w.
Eldorado (T)	Kansas	WAH	200	Skelly Oil Co. ..	1,578, 1,599 c.w.
Elko	Nevada	KDEJ	—	Post Office	3,407, 3,998 (Rec.)
Empire D.F.	43° 23' 03" N. 124° 18' 58" W.	NPF	100	U.S. Navy	800
Eureka NPW	40° 41' 45" N. 124° 16' 24" W.	NPW	450-600	U.S. Navy	600, 952, 3,039 (WT) spk. & c.w.
Eureka D.F.	40° 41' 48" N. 124° 16' 34" W.	NPW	100	U.S. Navy	800
Everett (Washington)	48° 00' 00" N. 122° 15' 00" W.	KFT	300	American Tugboat Co.	300, 600, 1,641 spk.
Fairfield	Ohio	WYD	250	U.S. Army	1,500 c.w.
Fairport (Virginia)	37° 49' 53" N. 76° 17' 26" W.	KDAH	175	C. E. Davis Packing Co.	300, 450, 600 spk.
Farallon Island D.F. (California)	37° 41' 58" N. 122° 59' 56" W.	NPI	100	U.S. Navy	800
Fire Island D.F. (New York State)	40° 37' 55" N. 73° 13' 01" W.	NJY	100	U.S. Navy	800
Flagship, Division I., Camp Eustis (T) (Virginia)	37° 08' 00" N. 76° 35' 00" W.	WPF	20	U.S. Shipping Board	300, 600 c.w.
Flint (T) (Michigan)	43° 00' 00" N. 83° 45' 00" W.	WGF	50	F. D. Fallain	135 c.w.
Folly Island D.F. (South Carolina)	32° 41' 00" N. 79° 53' 22" W.	NZV	100	U.S. Navy	800
Fort Adams	Rhode Island	—	—	U.S. Army	300 spk.
Fort Andrews (Massachusetts)	42° 08' 04" N. 79° 55' 44" W.	WUA	200	U.S. Army	1,100 spk.
Fort Barrancas (Florida)	30° 20' 43" N. 87° 18' 05" W.	WZD	200	U.S. Army	300 spk.
Fort Benjamin Harrison	Indiana	WVS	250	U.S. Army	1,559 c.w.
Fort Bliss (Texas)	31° 45' 00" N. 106° 00' 00" W.	WZO	2,000	U.S. Army	7,900 c.w.
Fort Bragg	North Carolina	WZG	300	U.S. Army	3,000 c.w.
Fort Brown	Texas, Brownsville	WUZ	250	U.S. Army	3,097 c.w.
Fort Casey	Washington	WZJ	50	U.S. Army	300 spk.
Fort Clark	Texas	WZB	25	U.S. Army	674 c.w.
Fort Constitution (New Hampshire)	43° 04' 16" N. 70° 42' 40" W.	WZE	50	U.S. Army	1,300 spk.
Fort Crockett	29° 16' 28" N. 94° 48' 52" W.	WUX	50	U.S. Army	1,090 spk.

UNITED STATES OF
AMERICA—contd.

Fort D. A. Russell	Wyoming	WVW	250	U.S. Army	1,347 c.w.
Fort des Moines ..	Iowa	WZT	—	—	672
Fort Douglas ..	Utah	WVX	250	U.S. Army	2,776 c.w.
Fort Ethan Allen ..	Vermont	WUIA	50	U.S. Army	669 c.w.
Fort Hancock	40° 37' 57" N.	WUB	200	U.S. Army	1,100 spk.
(New Jersey)	73° 13' 08" W.				
Fort Hayes ..	Ohio	WVZ	250	U.S. Army	1,410 c.w.
Fort H. G. Wright	41° 15' 20" N.	WUC	200	U.S. Army	1,090 spk. & c.w.
(New York State)	72° 01' 12" W.				
Fort Howard ..	Maryland	WVQ	250	U.S. Army	1,318 c.w.
Fort Huachuca ..	Arizona	WZP	—	U.S. Army	1,318 spk.
Fort Leavenworth	39° 21' 00" N.	WVC	1,000	U.S. Army	4,915 c.w.
(Kansas)	94° 55' 31" W.				
Fort Levett	43° 38' 40" N.	WUAV	200	U.S. Army	800 spk.
(Maine)	70° 11' 39" W.				
Fort McArthur	Texas	WUCK	300	U.S. Army	1,318 spk.
Fort McIntosh	27° 30' 29" N.	WUH	300-1,000	U.S. Army	1,363 spk. & c.w.
(Texas)	99° 31' 02" W.				
Fort McPherson ..	Georgia	WVR	500	U.S. Army	1,460, 2,552 c.w.
Fort Monroe	37° 00' 06" N.	WUF	200	U.S. Army	1,090 spk. & c.w.
(Virginia)	76° 18' 24" W.				
Fort Morgan WIO	32° 00' 00" N.	WIO	200	Tropical Radio Tele-	300, 800, 1,713
(Alabama)	87° 00' 08" W.			graph Co.	spk.
Fort Morgan WUR	Alabama	WUR	50	U.S. Army	1,700 spk.
Fort Moultrie ..	South Carolina	WZF	50	U.S. Army	1,090 spk.
Fort Niagara ..	New York State	WUE	—	U.S. Army	—
Fort Omaha ..	Nebraska	WVU	250	U.S. Army	1,304 c.w.
Fort Porter ..	New York State	WUD	—	U.S. Army	—
Fort Riley	39° 04' 35" N.	WUI	25	U.S. Army	600 c.w.
(Kansas)	96° 47' 01" W.				
Fort Ringgold ..	Texas	WZI	100	U.S. Army	1,347 c.w.
Fort Rodman ..	Massachusetts	WUCN	50	U.S. Army	536 spk.
Fort Rosecrans ..	California	WUS	200	U.S. Army	300 spk.
Fort Sam Houston	29° 26' 39" N.	WVB	2,000	U.S. Army	5,796 c.w.
(Texas)	98° 27' 44" W.				
Fort Screven	32° 06' 34" N.	WZA	50	U.S. Army	825 spk.
(Georgia)	80° 50' 37" W.				
Fort Sill ..	Oklahoma	WUBD	1,000	U.S. Army	3,748 c.w.
Fort Snelling ..	Minnesota	WZS	—	U.S. Army	1,091
Fort Stevens NZS D.F.	46° 11' 32" N.	NZS	150	U.S. Navy	800
(Oregon)	123° 59' 15" W.				
Fort Stevens WUK	Oregon	WUK	200	U.S. Army	600 spk.
Fort Storey ..	Virginia	WUAE	50	U.S. Army	300
Fort Terry ..	New York State	WUW	50	U.S. Army	669 spk.
Fort Tilder ..	New York State	WUBY	—	U.S. Army	300 spk.
Fort Totten	40° 47' 38" N.	WUL	200	U.S. Army	1,100 spk.
(New York)	73° 47' 00" W.				
Fort Travis	29° 21' 51" N.	WUBR	50	U.S. Army	825 spk.
(Texas)	94° 45' 31" W.				
Fort Washington	39° 00' 00" N.	WUAF	50	U.S. Army	1,200 spk.
(Maryland)	77° 00' 00" W.				
Fort Whitman ..	Washington	WZC	300	U.S. Army	1,091
Fort Williams ..	Maine	WUCU	25	U.S. Army	300 spk.
Fort Winfield Scott	37° 47' 36" N.	WUO	300	U.S. Army	1,500 spk.
(California)	122° 28' 30" W.				
Fort Worden ..	Washington	WUN	200	U.S. Army	1,091 spk.
Fort Worth ..	Texas	WRAP	200	Wortham Carter Pub-	1,500 c.w.
				lishing Co.	
Fourth Cliff D.F.	42° 09' 40" N.	NWM	100	U.S. Navy	800
(Massachusetts)	70° 42' 22" W.				
Frackville (T)	40° 46' 50" N.	WBI	100	Pennsylvania Power &	137 c.w.
(Pennsylvania)	76° 15' 06" W.			Light Co.	
Frankfort	44° 37' 46" N.	WFK	300	Ann Arbor Railway	600, 625, 1,666
(Michigan)	86° 14' 17" W.			Company	spk.
Fresno (T)	36° 43' 00" N.	KDNU	125	San Joaquin Light &	1,817 c.w.
(California)	119° 49' 00" W.			Power Co.	
Galveston	29° 18' 54" N.	NKB	150	U.S. Navy	600, 952, 1,428
(Texas)	94° 46' 52" W.				(W) spk.
Governors Island ...	New York State	WVP	200	U.S. Army	1,347, 1,444
					spk. & c.w.
Grand Marais D.F.	46° 40' 29" N.	NZT	100	U.S. Navy	600 (W),
(Michigan)	85° 58' 25" W.				800 (D F) spk.
Great Lakes	42° 18' 30" N.	NAJ	300-1,000	U.S. Navy	600, 1,986, 3,950
(Illinois)	87° 50' 00" W.				4,685 (W) c.w.

UNITED STATES OF AMERICA—contd.

Greensburg (Pennsylvania)	40° 18' 00" N. 79° 32' 30" W.	WJL	100	Pennsylvania State Police	1,599 c.w.
Guntersville (Alabama)	34° 25' 00" N. 86° 20' 00" W.	WKH	300	Nashville Chattanooga & St. Louis Rly.	1,621 spk.
Harrisburg (T) ..	40° 16' 00" N. 76° 55' 00" W.	WBAK	200	Pennsylvania State Police	400 c.w.
Hauto (T) (Pennsylvania)	40° 50' 40" N. 75° 59' 00" W.	WDS	100	Pennsylvania Light & Power Company	137 c.w.
Hazleton (T) (Pennsylvania)	40° 57' 30" N. 75° 59' 04" W.	WCJ	100	Pennsylvania Light & Power Company	137 c.w.
Hempstead	New York State	WWU	—	Post Office Dept. ..	3,407, 3,998 c.w.
Hillsboro KEK (Oregon)	45° 31' 00" N. 122° 59' 00" W.	KEK	500	Federal Telegraph Co.	300, 600, 706, 2,300 spk.
Hillsboro KGH ..	Oregon	KGH	500	Federal Telegraph Co.	4,207, 6,316, 8,896 c.w.
Hog Island D.F. (Virginia)	37° 22' 36" N. 75° 42' 37" W.	NCZ	150	U.S. Navy	800
Houston (Texas)	29° 43' 00" N. 95° 30' 00" W.	WFO	200	Iris Theatre	300, 600 spk.
Imperial Beach D.F. (California)	32° 35' 14" N. 117° 07' 54" W.	NPL	100	U.S. Navy	800
Indian Head (Maryland)	38° 38' 00" N. 77° 10' 55" W.	NBG	100	U.S. Navy	Variable spk.
Iowa City	Iowa	KDTS	—	Post Office	3,369, 3,998 (<i>Rec.</i>)
Jackson (T) (Ohio)	39° 10' 00" N. 82° 40' 00" W.	WJQ	100	Ford Motor Co. ..	1,934 c.w.
Jefferson Barracks ..	Missouri	WVV	250	U.S. Army	1,395 c.w.
Johnswood (Michigan)	45° 50' 00" N. 83° 40' 00" W.	KUVQ	200	Krectan Co.	300, 450, 600 spk.
Jupiter NAQ (Florida)	26° 56' 54" N. 80° 05' 02" W.	NAQ	300	U.S. Navy	600, 952, 1,304 (<i>W</i>) c.w.
Jupiter D.F. ..	26° 56' 50" N. 80° 04' 57" W.	NAQ	150	U.S. Navy	800
Kelly Field	Texas	WYG	250	U.S. Army	1,500 c.w.
Key West NAR (Florida)	24° 33' 00" N. 81° 48' 00" W.	NAR	300-1,000	U.S. Navy	600, 952, 1,463 (<i>TW Pr.</i>) spk. 2,100, 3,950, 11,490 c.w.
Key West D.F. ..	24° 33' 08" N. 81° 45' 18" W.	NAR	100	U.S. Navy	800
Key West WUBV ..	24° 30' 00" N. 81° 48' 00" W.	WUBV	50	U.S. Army	825 spk.
Klipsan Beech D.F. (Washington)	46° 27' 53" N. 134° 03' 16" W.	NZS	100	U.S. Navy	800
Laguna Bell Sub-sta- tion (California)	33° 58' 10" N. 118° 09' 00" W.	KYG	200	Southern California Edison Co.	1,585, 1,630, 1,685 c.w.
Lakehurst NEL (New Jersey)	40° 02' 15" N. 74° 20' 13" W.	NEL	200	U.S. Navy	545 spk.
Lakehurst D.F.	40° 02' 15" N. 74° 20' 13" W.	NEL	100	U.S. Navy	800
Langin Field ..	West Virginia	WYI	300	U.S. Army	1,500 c.w.
Langley Field Laramie	Virginia Wyoming	WYC WWD	250 —	U.S. Army	1,500 c.w.
Lawrenceville (T) (Illinois)	38° 42' 37" N. 87° 41' 15" W.	WJB	300	Indian Pipe Line Cor- poration	1,790 c.w.
Lima (Ohio)	40° 45' 20" N. 84° 06' 40" W.	WBY	200	Illinois Pipe Line Co.	1,689 c.w.
Long Beach T (California)	33° 46' 12" N. 118° 11' 17" W.	KUXT	50	Pacific Telegraph and Telephone Co.	300, 350, 400, 450, 500, 600
Los Angeles KfV (T) (Portable)	—	KfV	50	Forestry Dept. ..	146, 1,666 c.w.
Los Angeles KfZ (T) (Portable)	—	KfZ	50	Russell Reed ..	146 c.w.
Los Angeles KGV (T) (Portable)	—	KGV	150	Russell Reed ..	146 c.w.
Los Angeles KVT	California	KVT	150	Boulevard Express ..	300, 600, 1,599 c.w.
Los Angeles KWH (T)	California	KWH	150	Examiner Printing Co.	143 c.w.
Los Angeles KYX (Portable)	—	KYX	150	Pratt & Dutro ..	146 c.w.
Los Angeles KYY (T)	—	KYY	150	Forestry Dept. ..	146, 1,666 c.w.
Los Angeles KZI (T) (Portable)	—	KZI	100	Pratt & Dutro ..	146 c.w.

UNITED STATES OF
AMERICA—*contd.*

Ludington (Michigan)	43° 56' 47" N. 86° 26' 19" W.	WLD	300	Pere Marquette Rail- way Co.	300, 600, 1,666 spk.
Mackinac Island (Michigan)	45° 54' 00" N. 84° 35' 00" W.	WHQ	300	Mackinac Radio Ser- vice	300, 600 spk.
Maitson WHA (Wisconsin)	43° 04' 30" N. 89° 23' 45" W.	WHA	200	University of Wiscon- sin	1,277-1,304 c.w.
Manasquan D.F. (New Jersey)	40° 07' 05" N. 74° 01' 58" W.	NJY	150	U.S. Navy	800
Manistique (Michigan)	45° 57' 48" N. 86° 15' 35" W.	WOH	300	Ann Arbor Rly. Co. ..	600, 625, 1,666 spk.
Manitowoc (Wisconsin)	44° 07' 00" N. 87° 45' 00" W.	WMW	300	Pere Marquette Rail- way Company	300, 600, 1,666 spk.
Marion WCC (Massachusetts)	41° 42' 45" N. 70° 46' 30" W.	WCC	1,000	Radio Corporation of America, New York	300, 600, 1,800, 2,200, 2,300 c.w.
Marion WRQ	41° 42' 45" N. 70° 46' 30" W.	WRQ	4,000	Radio Corporation of America	13,330 c.w.
Marion WSO ..	Massachusetts	WSO	—	Radio Corporation of America	11,620 c.w.
Marquette Light Stn. (T) (Michigan)	46° 32' 11" N. 87° 22' 43" W.	WWEE	—	Bureau of Lighthouses	143 c.w.
Marshfield (Oregon)	43° 20' 38" N. 24° 13' 33" W.	NPF	300	U.S. Navy	600, 952, 1,947 spk.
Martinsville T (Illinois)	139° 20' 30" N. 87° 54' 06" W.	WHY	200	Illinois Pipe Line Co.	1,689 c.w.
Marysville (T) (Michigan)	42° 55' 40" N. 82° 27' 34" W.	KDPJ	150	Detroit Edison Co. ..	1,621 c.w.
Maxwell	Alabama	WYK	250	U.S. Army	1,500 c.w.
Maywood	Illinois	KDQA	—	Post Office Dept. ..	3,569, 3,998 Dec.)
Medicine Bow Peak	Wyoming	WWD	—	—	—
Memphis (Tennessee)	35° 09' 00" N. 90° 03' 00" W.	WPI	500	Inland Waterways Corporation	300, 600, 1,100 spk.
Metuchen (New Jersey)	40° 31' N. appx. 74° 24' W.	WUBB	—	U.S. Army	1,091 c.w.
Miami Beach ..	80° 07' 15" N. 25° 48' 21" W.	WAX	500	Tropical Radio Tele- graph Co.	300, 600, 706, 1,599, 1,800 spk.
Minneapolis WLB (T) (Minnesota)	44° 58' 21" N. 93° 14' 13" W.	WLB	100	University of Minne- sota	1,276-1,304 c.w.
Minneapolis WLP (T) (Minnesota)	44° 59' 00" N. 93° 18' 00" W.	WLP	100	Northern States Power Co.	1,764 c.w.
Mitchell Field ..	New York	WYA	250	U.S. Army	1,100, 1,559 c.w.
Mobile WNN (Alabama)	30° 41' 34" N. 88° 02' 27" W.	WNN	150	Tropical Radio Tele- graph Co.	300, 600, 1,713, 1,800 spk.
Mobile WPP ..	Alabama	200-500	—	Inland Waterways Corporation	300, 600, 1,100, 1,200 spk. 1,800 c.w.
Morehead City (North Carolina)	34° 43' 30" N. 76° 44' 00" W.	NAN	150	U.S. Navy	600, 952, 1,872 spk.
Negley (T) (Ohio) ..	40° 47' 48" N. 80° 34' 54" W.	WCQ	200	Illinois Pipe Line Co.	1,689 c.w.
Newark WJZ (New Jersey)	40° 44' 00" N. 74° 10' 00" W.	WJZ	300	Westinghouse Electric & Mfg. Co.	300, 600 spk.
New Brunswick WII	New Jersey	WII	4,000	Radio Corporation of America	13,550 c.w.
New Brunswick WRT (New Jersey)	40° 30' 10" N. 74° 29' 15" W.	WRT	4,000	Radio Corporation of America	11,500 c.w.
New Dungeness D.F. (Washington)	48° 10' 36" N. 123° 07' 51" W.	NFT	100	U.S. Navy	800
New London NBL (Connecticut)	41° 23' 39" N. 72° 05' 30" W.	NBL	150	U.S. Navy	600, 674, 952 c.w.
New London WST (Connecticut)	41° 18' 01" N. 72° 05' 02" W.	WST	200	Independent Wireless Telegraph Co., New York	300, 600, 625 spk.
New Orleans NAT ..	29° 56' 51" N. 90° 01' 54" W.	NAT	300-1,000	U.S. Navy	600, 952, 2,100, 2,607 (TW) 2,607, 3,950, 6,246 spk. & c.w.
New Orleans WNU ..	Louisiana	WNU	1,500	Tropical Radio Tele- graph Company	300, 600, 1,713, 2,850, 3,331 (W), 4,107 spk. & c.w..
Newport (Rhode Island)	41° 35' 20" N. 71° 17' 00" W.	NAF	300	U.S. Navy	600, 952, 2,607 (T) spk
New York KUVS ..	New York	KUVS	300	Police	300, 600, 730 s pk.

UNITED STATES OF AMERICA— <i>con.d.</i>					
New York NAH ..	40° 41' 58" N. 73° 58' 48" W.	NAH	300	U.S. Navy	600, 952, 1,538 (WT, Navy), 2,100 spk. & c.w. 300, 600 spk.
New York WCG ..	40° 42' 45" N. 74° 00' 23" W.	WCG	300	Independent Wireless Telegraph Company	300, 600 spk.
New York WHI ..	40° 43' 50" N. 73° 59' 31" W.	WHI	100	John Wanamaker ..	300, 600, 1,704 c.w.
New York WNY ..	40° 39' 30" N. 74° 00' 05" W.	WNY	200-300	Radio Corporation of America	300, 600, 680, 2,200, 2,375 c.w.
New York WSE ..	40° 40' 15" N. 73° 20' 31" W.	WSE	200-500	Independent Wireless Telegraph Company	300, 600, 1,800 spk. & arc.
Norfolk (1) (Virginia)	36° 49' 36" N. 76° 17' 43" W.	NAM	300-1,000	U.S. Navy	600, 952, 1,363 (WT), 2,100, 2,142, 3,950, 5,451 spk. & c.w.
Norfolk (2)	36° 50' 26" N. 75° 58' 58" W.	NAM	135	U.S. Navy	600, 952, 1,395, c.w. 600 spk.
North Atlantic Ice Patrol Service	—	NIDK	—	U.S. Navy	1,621 c.w.
North Head (Washington)	46° 17' 56" N. 124° 04' 31" W.	NPE	500	U.S. Navy	600, 952, 2,100, 2,726 (WT), 3,950, 4,997, spk.
North Island D.F. (South Carolina)	33° 13' 18" N. 79° 11' 10" W.	NZW	100	U.S. Navy	800
North Platte (Nebraska)	41° 09' N. appx. 100° 45' W. "	KDHM	—	Post Office	3,486, 3,998 (Rec.)
North Truro D.F. (Massachusetts)	42° 02' 23" N. 70° 03' 37" W.	NAE	100	U.S. Navy	800
Northville (T) (Michigan)	42° 20' 00" N. 83° 29' 00" W.	KDEP	50	Ford Motor Co. ..	1,905 c.w.
Oakland (Portable) California	—	KGA	—	Tribune Pub. Co. ..	143 c.w.
Oberlin (T) (Ohio) ..	41° 17' 00" N. 82° 14' 00" W.	WLK	50-200	Oberlin College ..	1,287 spk. & c.w.
Ocean Park D.F. (Washington)	46° 27' 53" N. 124° 03' 16" W.	NZS	150	U.S. Navy	375
Omaha	Nebraska	KDEF	—	Post Office	3,224, 3,998 (Rec.)
Owensboro (T) (Kentucky)	37° 46' 47" N. 87° 04' 15" W.	WJC	200	Indian Pipe Line Cor- poration	1,790 c.w.
Palm Beach ..	26° 42' 00" N. 80° 01' 55" W.	WOE	300	Palm Beach Radio Co.	300, 600, 650 spk.
Palo Alto (California)	37° 28' 00" N. 122° 07' 30" W.	KWT	1,000	Federal Telegraph Co.	3,074, 3,596, 4,324, 4,690, 5,808, 7,575 c.w.
Parris Island (South Carolina)	32° 21' 01" N. 80° 40' 22" W.	NAV	100	U.S. Navy	Variable spk.
Parsons (Kansas) ..	37° 20' 00" N. 95° 03' 00" W.	—	150	Kansas Gas & Electric Co.	1,966 c.w.
Pensacola NAS (Florida)	30° 20' 46" N. 87° 16' 54" W.	NAS	300	U.S. Navy	600, 952, 1,333 (W), spk. & c.w. 2,250 spk. & c.w.
Pensacola NAS D.F.	30° 20' 46" N. 87° 16' 54" W.	NAS	100	U.S. Navy	800
Philadelphia NAI (Pennsylvania)	39° 53' 20" N. 75° 10' 50" W.	NAI	300	U.S. Navy	600, 952, 1,304 (W) spk. & c.w.
Philadelphia WHE	39° 57' 06" N. 75° 09' 44" W.	WHE	100	John Wanamaker ..	300, 600, 1,704 c.w.
Pittsburgh (Portable) Pennsylvania	—	WWY	150	Bureau of Mines ..	Variable
Point Arguello D.F. (California)	34° 34' 38" N. 120° 38' 32" W.	NPK	100	U.S. Navy	800
Point Fermin D.F. (California)	33° 42' 19" N. 118° 17' 38" W.	NPX	100	U.S. Navy	800
Point Hueneme D.F. (California)	34° 08' 43" N. 119° 12' 30" W.	NMD	100	U.S. Navy	800
Point Loma D.F. (California)	32° 42' 21" N. 117° 15' 17" W.	NPL	100	U.S. Navy	800
Point Montara D.F. (California)	37° 32' 02" N. 122° 31' 07" W.	NLH	100	U.S. Navy	800
Point Reyes KDU (California)	37° 54' 30" N. 221° 40' 45" W.	KDU	4,000	Radio Corporation of America	13,100 c.w.

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Point Reyes NLG D.F.	38° 02' 13" N. 122° 59' 36" W.	NLG	100	U.S. Navy ...	800
Port Arthur (Texas)	29° 52' 46" N. 93° 55' 35" W.	WKI	400	D. M. Pieton & Co. ...	300, 600, 1,630 spk
Port Arthur WPA	29° 50' 50" N. 93° 57' 50" W.	WPA	300	Gulf Refining Co. ...	300, 600, 1,070, 1,800, 1,950, 2,050 spk. & c.w.
Portland (Oregon) ...	45° 31' 14" N. 122° 41' 00" W.	KLB	200	North Western Electric Co.	1,578 c.w.
Portsmouth (New Hampshire)	43° 04' 33" N. 70° 44' 00" W.	NAC	300	U.S. Navy ...	600, 952, 1,333 spk.
Pottsville (Pennsylvania)	40° 41' 00" N. 76° 12' 00" W.	WMB	100	Pennsylvania State Police	1,599 c.w.
Poyners Hill D.F. (North Carolina)	36° 17' 16" N. 75° 47' 48" W.	NCZ	100	U.S. Navy ..	800
Prices Neck D.F. (Rhode Island)	41° 27' 04" N. 71° 20' 16" W.	NGO	100	U.S. Navy ..	800
Puget Sound (Washington)	47° 41' 46" N. 122° 37' 03" W.	NPC	300-2,000	U.S. Navy ..	600, 952, 2,499, 3,950, 5,451, 8,870 spk. & c.w.
Pysht (T) (Washington)	48° 12' 00" N. 124° 07' 00" W.	KJA	25	Merill & Ring Lumber Co.	146 c.w.
Quantico (Virginia)	38° 49' 00" N. 77° 30' 00" W.	NFV	150	U.S. Navy ...	545 spk.
Quincy (Massachusetts)	42° 14' 10" N. 70° 58' 39" W.	KDGU	150	Bethlehem S.S. Corp.	1,966 c.w.
Raleigh (T) (North Carolina)	35° 47' 35" N. 78° 39' 45" W.	WLAC	300	North Carolina State College	500 c.w.
Reno ..	Nevada	KDEK	150	Post Office ..	3,784, 3,998 (Rec.)
Rochester (T) ..	New York State	WJF	100	Rochester Gas & Electric Co.	143 c.w.
Rock Springs ..	Wyoming	KDHN	—	Post Office ..	3,156, 3,998 (Rec.)
Rockwell Field ..	California	WYH	250	U.S. Army ..	1,500 c.w.
Rocky Point (New York State)	40° 55' 45" N. 72° 56' 30" W.	WQM	300	Radio Corporation of America	1,641 c.w.
Rogers, Michigan	45° 25' 00" N. 83° 50' 00" W.	WHT	500	Michigan Limestone & Chemical Co.	300, 600, 706 (W), 750, 1,764, 1,800 c.w.
St. Augustine (Florida)	29° 53' 10" N. 81° 17' 18" W.	NAP	300	U.S. Navy ..	600, 952, 2,342 (W) spk.
St. Croix Falls (Wisconsin)	45° 40' 00" N. 92° 40' 00" W.	WPL	100	Northern State Power Co.	1,764 c.w.
San Diego KVV	California	KVV	150	Boulevard Express ..	300, 600, 1,599 c.w.
San Diego NPL (California)	32° 42' 26" N. 117° 14' 49" W.	NPL	300-3,000	U.S. Navy ..	600, 952, 1,538 (T), 2,100, 3,950, 5,169, 9,798 (T Fr), spk. & c.w.
San Diego NQD	California	NQD	—	U.S. Navy Radio School	Variable
San Francisco KDQC	California	KDQC	—	Post Office ..	—
San Francisco KFS	37° 49' 36" N. 122° 30' 06" W.	KFS	200-500	Federal Telegraph Co.	300, 600, 706, 2,400 spk. & c.w.
San Francisco KHH (T)	California	KHH	150	J. P. Hickey ..	300, 600 spk. & c.w.
San Francisco KII (Portable)	California	KII	—	United Press ..	—
San Francisco KPH	California	KPH	300	Radio Corporation of America	Controlling
San Francisco KTA (T) (Portable)	California	KTA	200	Examiner Printing Co.	Bollinas KPH 143, 300, 600 c.w.
San Francisco NPG	37° 05' 03" N. 122° 15' 57" W.	NPG	300-2,500	U.S. Navy ..	600, 952, 1,333 (WT Pr.) spk., 2,100 (Cal.), 3,950 (Cal.), 4,522, (WT Pr.), 4,836, 7,006, 10,520, (Cal.), c.w.

UNITED STATES OF AMERICA—contd.					
San Francisco WVY	118° 05' 05" W.	WVY	500	U.S. Army	1,347 2,900 c.w.
St. George Reef (T) (California)	41° 50' 15" N. 124° 22' 28" W.	WWEI	10	Bureau of Lighthouses	—
Salt Lake City ..	Utah	KDEH	—	Post Office	3,258, 3,998 (Rec.) 800
Sandy Hook D.F. (New Jersey)	40° 27' 54" N. 73° 59' 50" W.	NJY	100	U.S. Navy	—
Savannah (Georgia)	32° 05' 15" N. 81° 06' 15" W.	NEV	150	U.S. Navy	600, 1,428 (W) spk.
Schenectady ..	New York State	WWS	—	Post Office	—
Scott Field	Illinois (Belle-ville)	WYF	50	U.S. Army	1,500 c.w.
Sea Girt Light Station (New Jersey)	40° 08' 12" N. 74° 01' 40" W.	—	—	Bureau of Lighthouses	1,000 (Bea) c.w.
Seattle KPE (Washington)	47° 37' 00" N. 122° 20' 00" W.	KPE	300	City of Seattle Harbor Dept.	300, 600, 1,641, 2,300 spk. & c.w.
Seattle KVV ..	47° 37' 00" N. 122° 20' 00" W.	KVV	200	Light Dept., Seattle	300, 425, 500, 600 c.w.
Selfridge Field ..	Michigan	WYE	250	U.S. Army	1,500 c.w.
Sheboygan (Wisconsin)	43° 45' 00" N. 87° 41' 30" W.	WSK	300	Reiss S.S. Co. ..	300, 600, 706, 1,764 c.w.
Shock (T)	Kentucky	WAAI	150	Sullivan Pond Creek Co.	1,610 c.w.
Skagit Power Site (T) (Washington)	48° 40' 00" N. 121° 15' 00" W.	WJE	150	Seattle Light Dept. ..	300, 600, 1,934 c.w.
Smith Island D.F. (Washington)	48° 19' 04" N. 122° 50' 39" W.	NFH	100	U.S. Navy	800
South Pass D.F. (Louisiana)	29° 00' 43" N. 89° 09' 32" W.	NBX	100	U.S. Navy	800
Springfield (T) (Massachusetts)	42° 08' 30" N. 72° 33' 08" W.	WBZ	300	Westinghouse Electric Manufacturing Co.	1,817 c.w.
Springfield (T) (Ohio)	40° 01' 00" N. 84° 02' 00" W.	WNA	200	Ford Motor Co. ..	1,875 1,934
Stamford University (T) (California)	37° 25' 35" N. 122° 10' 12" W.	KFGH	150	Leland Stanford University	1,290 c.w.
Stannard Rock Light Stn. (T) (Michigan)	47° 10' 59" N. 87° 13' 30" W.	WWED	—	Bureau of Lighthouses	143 c.w.
Stevens Point (Wisconsin)	44° 35' 00" N. 89° 30' 00" W.	WCP	—	Wisconsin Dept. of Markets	1,578 c.w.
Superior (T) (Michigan)	42° 15' 44" N. 83° 38' 27" W.	KDPI	40	Detroit Edison Co. ..	1,625 c.w.
Superior Entry Light Stn. (T) (Wisconsin)	46° 42' 37" N. 92° 00' 21" W.	WWEC	—	Bureau of Lighthouses	145 c.w.
Surfside D.F. (Nantucket, Mass.)	41° 14' 39" N. 70° 05' 53" W.	NBS	100	U.S. Navy	800
Tampa (Florida) ..	27° 58' 00" N. 82° 27' 00" W.	WPD	300	George C. Warner, Jr.	300, 600 spk.
Tatoosh NPDP D.F.	48° 23' 41" N. 124° 44' 13" W.	NPD	100	U.S. Navy	800
Thatcher's Isd. D.F. (Massachusetts)	42° 38' 10" N. 70° 34' 45" W.	NWM	100	U.S. Navy	800
Tuckerton WGG (New Jersey)	39° 33' 00" N. 74° 23' 00" W.	WGG	4,000	Radio Corporation of America	15,900 c.w.
Tuckerton WGH ..	39° 33' 00" N. 74° 23' 00" W.	WGH	4,000	Radio Corporation of America	90, 93, 97, 100, 103 c.w.
Tuckerton WSC ..	39° 33' 00" N. 74° 23' 00" W.	WSC	500	Radio Corporation of America	300, 600, 670 c.w.
Tullahoma (Tennessee)	35° 23' 00" N. 86° 15' 00" W.	WJJ	300	Nashville, Chattanooga & St. Louis Rly.	1,621 spk.
Tulsa (T) (Oklahoma)	35° 20' 00" N. 96° 00' 00" W.	WEH	200	Skelly Oil Co. ..	1,578, 1,599 c.w.
Tybee Island D.F. (Georgia)	32° 00' 58" N. 80° 50' 27" W.	NEV	100	U.S. Navy	800
Underwood (Washington)	45° 45' 41" N. 121° 31' 29" W.	KFL	200	North Western Electric Co.	1,578 c.w.
Vesta Sub-Station (California)	35° 50' 00" N. 119° 04' 30" W.	KQY	200	Southern California Edison Co.	1,585, 1,630, 1,685 c.w.
Virginia Beach D.F. (Virginia)	36° 51' 10" N. 75° 58' 33" W.	NCZ	100	U.S. Navy	800
Washington NAA (Arlington)	38° 52' 05" N. 77° 04' 47" W.	NAA	1,000-1,500	U.S. Navy	435, 2,653 (W Pr T), 2,939, 3,950, 5,949 (W) c.w.

UNITED STATES OF
AMERICA—*contd.*

Washington NAL (Navy Yard)	38° 52' 22" N. 76° 59' 46" W.	NAL	300-1,000	U.S. Navy	952, 1,199, 2,653 2,939, 3,950 spk. & c.w. 9,141 c.w.
Washington NDD (Sayville)	40° 44' 36" N. 73° 06' 12" W.	NDD	3,000	U.S. Navy	—
Washington NKF	District of Columbia	NKF	—	—	—
Washington NSJ (Laboratory)	District of Columbia	NSJ	—	U.S. Navy, Bureau of Standards	—
Washington NSS (Annapolis)	38° 59' 25" N. 76° 27' 00" W.	NSS	5,000	U.S. Navy	17,130 W T Pr.) c.w.
Washington WVA (Laboratory)	District of Columbia	WVA	—	U.S. Army	1,333, 2,653 c.w.
Washington WWV	—	WWV	—	Bureau of Standards	—
Washington WWX	District of Columbia	WWX	—	Post Office	3,656, 3,998 (Rec.)
Waupaca (Wisconsin)	44° 26' 00" N' 89° 00' 00" W.	WPAH	100	Wisconsin Dept. of Markets	1,578 c.w.
West Memphis ..	Arkansas	WYCJ	200	U.S. Army	700 spk.
West Point ..	New York State	WUAH	25	U.S. Army	1,091 c.w.
Whitefish Point D.F. (Michigan)	46° 46' 19" N. 84° 57' 22" W.	NZT	100	U.S. Navy	800
Wichita, Kansas	37° 41' 00" N. 97° 20' 30" W.	KYF	150	Kansas Gas & Electric Co.	1,966 c.w.
Williamsport (T) (Pennsylvania)	41° 15' 03" N. 77° 01' 00" W.	WPH	100	Pennsylvania Power & Light Co.	137 c.w.
Wilmington KFRE (California)	33° 46' 10" N. 118° 16' 15" W.	KFRE	25	L. C. Dent	1,713 c.w.
Wilmington KSE ..	California	KSE	300	Radio Corporation of America	300, 600 spk.
Wilsonville (T) (Pennsylvania)	41° 25' 00" N. 75° 10' 00" W.	WLF	100	Pennsylvania Power & Light Co.	137 c.w.
Wyandotte (Michigan)	42° 13' 08" N. 83° 09' 06" W.	WCV	150	Wyandotte Transport- ation Co.	300, 600, 750, 1,790 c.w.
Wyoming (Pennsylvania)	41° 18' 30" N. 75° 50' 00" W.	WDX	50	Pennsylvania State Police	1,599 c.w.
Yarmouth Sound (Bay of Fundry)	43° 46' 24" N. 66° 07' 20" W.	VAU	—	U.S. Navy	800 (Bea)
Lightships					
Ambrose Channel ..	40° 36' 20" N. 74° 03' 05" W.	WWAT	100	Bureau of Lighthouses	600, 1,000 (Bea), spk.
Blunt's Reef ..	40° 36' 04" N. 124° 30' 14" W.	WWBU	25	Bureau of Lighthouses	600, 1,000 (Bea), spk.
Boston ..	42° 20' 22" N. 70° 45' 26" W.	—	100	Bureau of Lighthouses	1,000 (Bea) spk.
Brunswick ..	31° 00' 00" N. 81° 09' 35" W.	WWBG	125	Bureau of Lighthouses	300, 600 (Bea), 952 spk.
Cape Charles ..	37° 05' 00" N. 75° 43' 00" W.	WWAY	100	Bureau of Lighthouses	300, 378, 476, 600 (Bea), 756, 952 spk.
Cape Lookout Shoals (N. Carolina)	34° 18' 00" N. 74° 24' 00" W.	WWBA	100	Bureau of Lighthouses	300, 378, 476, 600 (Bea), 756, 952 spk.
Columbia River ..	46° 10' 45" N. 124° 10' 35" W.	WWBQ	100	Bureau of Lighthouses	600, 1,000 (Bea), spk.
Cornfield Point (Connecticut)	41° 13' 00" N. 72° 23' 00" W.	WWAM	100	Bureau of Lighthouses	300, 378, 476, 600, 756, 952 spk.
Diamond Shoals ..	35° 05' 08" N. 75° 18' 38" W.	WWAZ	100	Bureau of Lighthouses	600, 1,000 (Bea), spk.
Fenwick Isld. Shoal (Delaware)	33° 26' 00" N. 74° 46' 00" W.	WWAW	100	Bureau of Lighthouses	300, 378, 476, 600, 756, 952 spk.
Fire Island ..	40° 28' 40" N. 73° 11' 26" W.	WWAN	100	Bureau of Lighthouses	600, 1,000 (Bea), spk.
Five Fathom Bank (New Jersey)	38° 47' 12" N. 74° 34' 33" W.	WWAR	125	Bureau of Lighthouses	600, 1,000 (Bea), spk.
Frying Pan Shoal ..	33° 33' 30" N. 76° 48' 20" W.	WWBE	100	Bureau of Lighthouses	300, 600 spk.
Heald Bank ..	29° 06' 05" N. 94° 13' 27" W.	WWBJ	100	Bureau of Lighthouses	300, 378, 476, 600, 756, 952 spk.

UNITED STATES OF AMERICA—contd.

Nantucket Shoals .. (Massachusetts)	40° 37' 02" N. 69° 37' 06" W.	WWAH	150	Bureau of Lighthouses	800, 1,000 (Bea) spk.
North East End .. (New Jersey)	38° 37' 00" N. 74° 29' 00" W.	WWAQ	100	Bureau of Lighthouses	300, 600, 952 spk.
Pollock Rip Slue .. (Massachusetts)	41° 36' 40" N. 69° 53' 47" W.	WWAG	100	Bureau of Lighthouses	300, 378, 476, 600, 756, 952 spk.
San Francisco .. (California)	37° 45' 03" N. 122° 41' 20" W.	WWBV	25	Bureau of Lighthouses	800, 1,000 (Bea), spk.
Swiftsure Bank .. (Washington)	48° 31' 30" N. 125° 00' 00" W.	WWBO	100	Bureau of Lighthouses	600, 1,000 (Bea), spk.
Umatilla Reef .. (Washington)	48° 09' 53" N. 124° 50' 45" W.	WWBP	100	Bureau of Lighthouses	300, 600 spk.
Winter Quarter Shoals (Virginia)	37° 55' 00" N. 74° 56' 00" W.	WWAX	100	Bureau of Lighthouses	300, 600, 952 spk.
Relief No. 72 ..	—	WWBB	—	Bureau of Lighthouses	—
Relief No. 76 ..	—	WWBW	—	Bureau of Lighthouses	—
Relief No. 78 ..	—	WWAS	—	Bureau of Lighthouses	300, 378, 476, 600, 756, 952 spk.
Relief No. 85 ..	—	WWAI	—	Bureau of Lighthouses	—
Relief No. 90 ..	—	—	—	—	—
Relief No. 92 ..	—	WWBR	—	Bureau of Lighthouses	—
Relief No. 109 ..	—	WWBH	—	Bureau of Lighthouses	300, 600 spk.
Lighthouses (General Call)	—	WWLH	—	Bureau of Lighthouses	—
ALASKA (See note S)					
Afognak ..	58° 00' 00" N. 152° 48' 00" W.	WWT	150	Bureau of Fisheries ..	300, 425, 600, 1,200 c.w.
Akutan .. (Aleutian Islands)	54° 08' 00" N. 165° 48' 00" W.	KMW	150	N. Pacific Sea Products Co.	300, 600, 1,600 c.w.
Alitak .. (Kodiak Island)	57° 09' 00" N. 154° 14' 00" W.	KYL	150	Alaska Packers' Asso- ciation	300, 500, 600 spk.
Anvik ..	62° 39' 00" N. 160° 12' 00" W.	KKP	50	John W. Chapman ..	300, 450, 600 c.w.
Becharof ..	58° 16' 00" N. 157° 23' 00" W.	KUDV	200	Alaska Packers' Asso- ciation	300, 500, 600 spk.
Bethel ..	60° 48' 00" N. 161° 45' 00" W.	WVI	—	U.S. Army ..	300, 500, 600 c.w.
Candle (T) ..	65° 55' 00" N. 161° 58' 00" W.	KGF	25	Robinson & Greenburg	300, 550, 600 c.w.
Cape Chacon ..	—	KFN	150	—	300, 350, 600 spk.
Cape Hinchinbrook D.F.	60° 14' 00" N. 146° 38' 54" W.	NRM	150	U.S. Navy ..	800
Cape Sarichef (T) ..	54° 35' 50" N. 164° 55' 40" W.	WWEF	10	Bureau of Lighthouses	256, 297, 345, 400, 600 c.w.
Cape Spencer (T) ..	—	WWEH	—	Bureau of Lighthouses	—
Carlisle ..	59° 02' 00" N. 156° 48' 00" W.	KOV	300	Carlisle Packing Co.	300, 600, 1,610 spk.
Chichagof ..	57° 39' 35" N. 136° 05' 40" W.	KRX	200	Chichagof Mining Co.	300, 550, 600 spk.
Chiguik KHC ..	56° 17' 30" N. 158° 31' 30" W.	KHC	300	Alaska Packers' Asso- ciation	300, 600, 1,600 spk.
Chiguik KNP ..	56° 17' 00" N. 158° 23' 00" W.	KNP	300	Columbia River Packers' Association	300, 525, 600, 1,650 spk.
Chisik Island ..	60° 10' 00" N. 152° 25' 00" W.	KUCP	300	Pioneer Canneries ..	300, 550, 600, 1,650 spk.
Chomly ..	55° 15' 00" N. 132° 20' 00" W.	KDP	150	Alaska Consolidated Canneries	300, 450, 550, 600 spk.
Circle ..	65° 49' 12" N. 144° 04' 18" W.	WVA	500	U.S. Army ..	2,200, 4,000 c.w.
Clark's Point ..	58° 50' 45" N. 158° 31' 30" W.	KHG	200	Alaska Packers' Asso- ciation	300, 400, 600 spk.
Cordova ..	60° 28' 30" N. 145° 25' 30" W.	NPA	300-2,000	U.S. Navy ..	600, 952, 2,100, 2,726, 3,950, 5,996 600 c.w.
Craig ..	55° 25' 00" N. 133° 15' 00" W.	WXO	200	U.S. Army ..	—
Daly ..	58° 59' 00" N. 158° 32' 30" W.	KDJT	150	Alaska-Portland Pack- ers' Association	300, 550, 600 spk.
Dutch Harbor ..	53° 53' 14" N. 166° 33' 07" W.	NPR	300	U.S. Navy ..	600, 952, 2,254 (W) spk.

ALASKA—*contd.*

Egegik	58° 16' 00" N. 157° 16' 00" W.	KMF	150	Libby, McNeill & Libby	300, 500, 600 c.w.
Ekuk	56° 49' 00" N. 156° 30' 00" W.	KMG	150	Libby, McNeill & Libby	300, 550, 600 spk.
Fairbanks	64° 50' 17" N. 147° 42' 21" W.	WXP	500	U.S. Army	3,700 c.w.
False Pass	55° 08' 00" N. 162° 55' 00" W.	KJL	200	P. E. Harris & Co. ..	300, 525, 600 , 1,650 spk.
Fort Egbert (T) (Eagle)	64° 46' 19" N. 141° 13' 48" W.	WXQ	100	U.S. Army	600 c.w.
Fort Gibbon	65° 10' 16" N. 152° 05' 21" W.	WXS	1,000	U.S. Army	1,100 c.w.
Fort St. Michael (T)	63° 40' 00" N. 162° 10' 00" W.	WXT	100	U.S. Army	600 c.w.
Fort Yukon	66° 30' 00" N. 145° 40' 00" W.	WXX	100	U.S. Army	600 c.w.
Fortuna	—	WXN	—	—	—
Funter	57° 00' 00" N. 135° 00' 00" W.	KXK	—	Thlinket Packet Co. ..	300, 550, 600 spk.
Hawk Inlet	58° 05' 00" N. 134° 45' 00" W.	KKAI	150	P. E. Harris & Co. ..	300, 550, 600 spk.
Hidden Inlet	54° 56' 40" N. 130° 20' 02" W.	KQL	300	A. & P. Products Co.	300, 450, 550, 600 spk.
Holy Cross (T) ..	62° 10' 00" N. 160° 00' 00" W.	WUY	300	U.S. Army	550 c.w.
Hot Springs	64° 55' 10" N. 150° 58' 15" W.	WXK	100	U.S. Army	620 c.w.
Hunters Bay	54° 52' 20" N. 132° 19' 00" W.	KQI	150	North Western Fish- eries Co.	300, 550, 600 spk.
Hyder	55° 40' 00" N. 130° 10' 00" W.	KDFA	300	Hyder Radio & Tele- phone Co.	300, 600 , 1,610 spk.
Iditarod (T)	62° 40' 00" N. 158° 00' 00" W.	WXL	100-300	U.S. Army	600 , 3,500 c.w.
Ikatan	54° 45' 00" N. 163° 30' 00" W.	KXW	100	Pacific American Fish- eries	550, 600 spk.
Juneau	—	WUJ	—	U.S. Army	—
Kanatak	57° 42' 00" N. 157° 39' 30" W.	KGC	300	Associated Oil Co. ..	300, 525, 600 , 1,800 spk.
Karluk	57° 35' 30" N. 154° 25' 00" W.	KYK	25	Alaska Packers' Asso- ciation	300, 500, 600 spk.
(Kodiak Island)	55° 32' 00" N. 132° 24' 00" W.	KMC	150	North Western Fish- eries Co.	300, 550, 600 spk.
Kassan	60° 10' 00" N. 144° 30' 00" W.	KSC	150	Chilkat Oil Company	300, 600 , 1,650 spk.
Katalla	60° 32' 45" N. 151° 14' 00" W.	KLD	150	North Western Fish- eries Co.	300, 550, 600 spk.
Kenai KLD	60° 32' 45" N. 151° 16' 00" W.	KYZ	200	Libby, McNeill & Libby	300, 450, 550, 600 spk.
Kenai KYZ	—	WUT	—	U.S. Army	—
Ketchikan	55° 05' 00" N. 162° 20' 00" W.	KJK	250	Pacific American Fisheries	300, 600 , 1,610 spk.
King Cove	57° 46' 45" N. 152° 21' 45" W.	NPS	500	U.S. Navy	600 , 952, 1,684
Kodiak	58° 50' 00" N. 157° 02' 00" W.	KUBX	20	Alaska Packers' Asso- ciation	300, 400, 600 , 1,600 spk.
Koggiung KUBX ..	58° 52' 30" N. 156° 55' 30" W.	KVV	300	Libby, McNeill & Libby	300, 450, 600 , 1,600 spk.
Koggiung KVV ..	—	WXW	—	U.S. Army	1,000
Kotzebue	58° 20' 00" N. 154° 05' 00" W.	KDN	150	Hemrich Packing Co.	300, 550, 600
Kukak Bay	60° 20' 00" N. 151° 22' 00" W.	KKAO	200	Alaska Packers' Asso- ciation	525, 600 , 1,610 spk.
Kussilof	59° 03' 00" N. 156° 48' 00" W.	KHB	200	Alaska Packers' Asso- ciation	300, 400, 600 , spk.
Kvichak KHB	59° 00' 00" N. 157° 00' 00" W.	KVQ	25	Alaska Packers' Asso- ciation	300, 400, 600 spk.
Kvichak KVQ	60° 00' 00" N. 148° 00' 00" W.	KIM	300	Kennecott Copper Corporation	300, 600, 1,650 spk.
(Moored vessel)	56° 58' 00" N. 154° 05' 00" W.	KEPS	130	Alitak Packing Co.	300, 600 , 1,650 spk.
Latouche	59° 00' 00" N. 158° 30' 00" W.	KMT	300	Libby, McNeill & Libby	300, 600 , 1,700 spk.
Lazy Bay	65° 36' 54" N. 148° 32' 18" W.	WUV	100	U.S. Army	1,800, 2,000 c.w. 600 c.w.
Libbyville	59° 05' 45" N. 156° 37' 50" W.	KML	150	Libby, McNeill & Libby	300, 500, 600 spk.
Livengood (T) ..	—	—	—	—	—
Lockanok	—	—	—	—	—

ALASKA—contd.

Lost Harbour ..	54° 15' 00" N. 165° 35' 00" W.	KWS	200	Alaska Sulphur Co. ..	300, 550, 600 spk.
Naknek KHT ..	58° 43' 30" N. 157° 00' 00" W.	KHT	300	Alaska Packers' Asso- ciation	300, 500, 600, 1,610 spk.
Naknek KMK ..	58° 43' 20" N. 156° 25' 00" W.	KMK	500	Naknek Packing Co.	300, 500, 600, 1,800 spk.
Nelson Lagoon ..	55° 55' 00" N. 160° 50' 00" W.	KXV	100	Pacific American Fisheries	550, 600, spk.
Nome (T) ..	64° 30' 20" N. 165° 23' 33" W.	WXY	500	U.S. Army ..	600, 4,000 c.w.
Nulato (T) ..	64° 43' 30" N. 158° 06' 48" W.	WXZ	100	U.S. Army ..	650 c.w.
Nushagak ..	59° 00' 00" N. 158° 30' 00" W.	KKAE	300	Libby, McNeill & Libby	300, 550, 600, 1,600 spk.
Nushagak Bay ..	58° 51' 00" N. 158° 31' 00" W.	KLJ	200	Columbia River Packers Association ..	300, 600, 1,600 spk.
Pearl Creek Dome ..	57° 42' 00" N. 156° 04' 00" W.	KFU	300	Standard Oil Co. of California	450, 1,700 spk.
Pillar Bay ..	57° 15' 45" N. 134° 14' 20" W.	KYV	150	Didalgo Island Packing Co.	300, 550, 600 spk.
Pirate Cove ..	55° 21' 50" N. 160° 21' 40" W.	KOXN	500	Union Fish Company	300, 600, 1,650 spk.
Port Althorp ..	58° 08' 00" N. 136° 15' 00" W.	KLW	300	Deep Sea Salmon Co.	300, 550, 600 spk.
Port Beauclair ..	56° 18' 00" N. 133° 54' 00" W.	KWO	300	Beauclair Packing Co.	300, 550, 600 spk.
Port Moller ..	55° 50' 00" N. 160° 40' 00" W.	KWR	250	Pacific - American Fisheries	300, 450, 600, 1,610 spk.
Port Walter ..	56° 20' 00" N. 134° 40' 00" W.	KEQ	100	Alaska Herring and Sardine Co.	300, 500, 600 spk.
Pybus Bay ..	57° 20' 00" N. 134° 00' 00" W.	KFC	150	Alaska Consolidated Canneries	300, 450, 550, 600 spk.
Quadra KHD ..	55° 06' 00" N. 130° 48' 00" W.	KHD	150	Alaska Consolidated Canneries	300, 450, 550, 600 spk.
Quandra KOR ..	55° 04' 45" N. 130° 44' 00" W.	KOR	150	North - Western Fisheries Co.	300, 550, 600 spk.
Radioville ..	57° 36' 30" N. 136° 09' 20" W.	KWW	200	Joseph T. Bauner ..	300, 550, 600 spk.
Red Bluff Bay ..	56° 20' 00" N. 134° 40' 00" W.	KXS	150	Baranoff Packing Co.	300, 550, 600 spk.
Rose Inlet ..	54° 57' 00" N. 132° 59' 00" W.	KJC	150	Alaska Consolidated Canneries	300, 450, 555, 600 spk.
Ruby KDRH .. (Moored vessel)	58° 50' 00" N. 157° 02' 00" W.	KDRH	15	Alaska Packers' Asso- ciation	300, 400, 600 spk.
Ruby WXU ..	64° 42' 20" N. 155° 30' 25" W.	WXU	100	U.S. Army ..	600 c.w.
Savoonga .. (St. Lawrence Isld.)	63° 30' 00" N. 169° 30' 00" W.	WWP	—	Bureau of Education	Variable
S. Paul .. (Pribilof Isds.)	57° 07' 20" N. 170° 16' 20" W.	NPQ	300, 1,500	U.S. Navy ..	600, 952, 2,653, 3,950, 5,657 spk & c.w.
Saltchuck ..	55° 35' 00" N. 132° 30' 00" W.	KWQ	100	Saltchuck Mining Co.	300, 550, 600 spk.
Schumigan ..	55° 12' 48" N. 160° 33' 06" W.	KHI	150	Pacific - American Fisheries	300, 550, 600 spk.
Scotch Cap (T) ..	54° 23' 52" N. 164° 44' 40" W.	WWEQ	10	Bureau of Lighthouses	256, 297, 345, 400, 600 c.w.
Seldovia ..	59° 50' 00" N. 152° 00' 00" W.	KEA	300	Adam Lipke ..	300, 550, 600, spk.
Seward ..	60° 07' 00" N. 149° 24' 00" W.	NPV	200	U.S. Navy ..	600, 1,428 spk.
Siginaka ..	57° 09' 50" N. 135° 26' 40" W.	KXD	50	W. M. Cook ..	300, 550, 600, spk.
Sitka ..	57° 02' 57" N. 135° 21' 00" W.	NPB	500, -1,000	U.S. Navy ..	600, 952, 2,653 spk. & c.w.
Snag Point ..	59° 02' 30" N. 158° 27' 15" W.	KHF	200	Alaska Packers' Asso- ciation	300, 400, 500, 600 spk.
Soapstone Point D.F.	58° 06' 13" N. 136° 29' 51" W.	NUW	150	U.S. Navy ..	800
Squaw Harbour ..	55° 12' 48" N. 160° 33' 06" W.	KHI	150	Shumigan Packing Co.	300, 550, 600 spk.
Tacotna ..		WXV	—	U.S. Army ..	600
Tee Harbor ..	58° 26' 00" N. 134° 45' 00" W.	KQP	150	Alaska Consolidated Canneries	300, 450, 550, 600 spk.
Tenakee ..	57° 52' 00" N. 135° 00' 00" W.	KOSC	200	Columbia Salmon Co.	300, 550, 600 spk.

ALASKA—contd.

Tree Point Lighthouse Stn.	54° 45' 07" N. 130° 55' 57" W.	KJJ	25	G. E. Maddox	300, 550, 600 c.w.
Ugashik	57° 34' 28" N. 157° 35' 00" W.	KMU	200	Red Salmon Canning Co	300, 500, 600
Unga	55° 20' 45" N. 160° 38' 39" W.	KVI	300	Alaska Codfish Co. ...	300, 600, 800 spk.
Union Bay	55° 47' 22" N. 132° 11' 38" W.	KON	300	A. & P. Products Co.	300, 500, 600, 1,610 spk.
Uyak KHA	57° 37' 30" N. 153° 59' 40" W.	KHA	300	Alaska Packers' Association	300, 500, 600, 1,610 spk.
Uyak KHV	57° 38' 10" N. 154° 00' 20" W.	KHV	150	North-Western Fisheries Co.	300, 550, 600 spk.
Valdez (T)	61° 06' 00" N. 146° 17' 00" W.	WXJ	25	U.S. Army	1,100 c.w.
Warren	58° 42' 00" N. 156° 56' 00" W.	KDJU	150	Alaska-Portland Packers Association	300, 550, 600, 1,610 spk.
Wiseman	—	WXG	—	U.S. Army	—
Yakutat	59° 34' 00" N. 139° 46' 00" W.	KKA	500	Libby, McNeill & Libby	300, 550, 600 spk.
Yes Bay	55° 55' 00" N. 131° 48' 00" W.	KRU	150	Alaska Consolidated Canneries	300, 450, 500, 600 spk.

URUGUAY

Cerrito (Monte Video)	34° 51' 20" S. 56° 10' 10" W.	CWA	1,000	Government	600, (W), 1,000, 1,250 spk., 1,800 c.w.
English Bank ¹ (Montevideo)	35° 06' 30" S. 35° 53' 30" W.	CWC	100	Government	450, 600 spk.
Lobos Isld.	35° 01' 39" S. 54° 53' 01" W.	CWB	100	Government	450, 600 spk.
Rocha	34° 30' 12" S. 54° 20' 10" W.	CWR	200	Government	600-1,000 spk.

VENEZUELA

Barquisimeto	10° 03' 57" N. 68° 18' 45" W.	AYH	400	Government	1,650, 2,400, 3,200, 3,600, 4,400 c.w.
Caracas (T)	10° 30' 24" N. 66° 55' 45.45" W.	AYA	500	Government	1,800-2,100, 1,650 c.w.
Guaira (La)	10° 36' 49" N. 66° 56' 45" W.	AYG	300	Government	300, 600, spk.
Maracay (T)	10° 15' 37" N. 67° 36' 45" W.	AYB	300	Government	1,450, 1,650, 1,950 c.w.
Maracaybo	10° 38' 32" N. 71° 36' 30" W.	AYF	300	Government	300, 600, 1,200 spk.
Porlamar (Isla de Margarita)	10° 56' 51" N. 63° 51' 13.5" W.	AYE	200	Government	300, 600, 900, 1,650 spk.
Puerto Cabello (T)	10° 29' 42" N. 68° 00' 30" W.	AYC	300	Government	600, 1,650, 1,950 c.w.
S. Cristobal	07° 46' 11" N. 72° 14' 30" W.	AYD	400	Government	1,650, 2,400, 3,200, 3,600, 4,400 c.w.

VIRGIN ISLANDS

S. Croix	17° 45' 09" N. 64° 42' 16" W.	NNI	100	U.S. Navy	450 (W) 600 spk.
S. Thomas (West Indies)	18° 20' 23" N. 64° 55' 52" W.	NBB	150	U.S. Navy	600, 952, 1,685 (W) spk.

**WINDWARD
PASSAGE**

Navassa Island	18° 24' 00" N. 75° 21' 00" W.	WWEA	10	Bureau of Lighthouses	—
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**YUGO-SLAVIA (v)(See
Serbs, Croats, and
Slovenes (King-
dom of)****ZANZIBAR**

Pemba	05° 14' 20" S. 39° 46' 06" E.	VQE	85	Government	300, 600, 2,000 (FX) spk.
Zanzibar	06° 09' 58" S. 39° 11' 29" E.	VPZ	300	Government	300, 600, 2,000 (FX) spk.

NOTES FOR LAND STATIONS.

- (A) CANADA.
Lurcher Lightship only handles messages relating to weather, ice, navigation warnings and distress.
Clarke City, Fame Point, Father Point, and Montreal only open during the season of navigation, approximately April to December.
- (B) DENMARK.
Gjedser station is used mainly for correspondence with the Danish ferry boats on the Gjedser-Warnemünde line.
- (C) GERMANY.
Bremerhaven Lloydhalle only undertakes correspondence between the N.D.L. and their ships and the transmission of semaphore telegrams to and from the Weser Lightship.
- (D) GREAT BRITAIN.
Andover, Bircham Newton, Calshot, Castle Bromwich, Cattewater, Cranwell, Croydon, Didsbury, Duxford, Farnborough, Flowerdown, Guernsey, Henlow, Isle of Grain, Lee-on-Solent, Lerwick, Leuchars, Lymington, Netheravon, Old Sarum, Pulham, Renfrew, Spithead, and Uxbridge, for Aircraft Service only.
- (E) GREECE.
Isthmus of Corinth station is used in connection with the passage of ships through the Isthmus.
- (F) HOLLAND.
The call sign PCF applies to any or all aerodromes of the Royal Navy; it is followed, when necessary, by the name or number of a particular aerodrome.
- (G) ITALY.
Ancona, Leghorn, Saseo, Spezia and Taranto, are purely military stations.
When *Messina* is occupied with military or state correspondence, ships which are north of the Strait of Messina should transmit their traffic with Palermo, Naples or C. Sperone. Those South of the Straits with *Vittoria* or *Cotrone*.
- (H) JAPAN.
Horomushiro station is open approximately from 1st May to 30th September, and is connected with the land telegraph system through the *Otsuchi Coast* station.
Komoto, Mohuho, Shogetsubito and Shoseito are lighthouses whose traffic is limited to intercommunication with each other, with the ship *Kosai Maru* belonging to the Chosen Government, and with Japanese warships.
Minamiogarijima corresponds only with Japanese stations.
- (I) LATVIA.
Ventspils is used principally for official correspondence but will accept public correspondence destined for *Ventspils* if, for any reason, other Latvian coast stations do not reply.
- (J) MALTA.
Calafrana communicates only with aircraft and fixed stations.
- (K) MARTINIQUE.
Fort de France being primarily a naval station only admits general public correspondence if there is no official correspondence.
- (L) NEWFOUNDLAND AND LABRADOR.
Stations in Labrador are only open from July to October.
- (M) NORWAY.
Fauske. Between 08.00 and 02.00 correspondence should preferably be exchanged through *Røst*.
- (N) ROUMANIA.
Constanta Tunnel, CVAZ. Public correspondence limited to certain specified ships.
- (O) SPAIN.
The small stations at *Cadix* and *Malagares* only transmit the correspondence of the Cie Transatlantique Espagnole.
Los Alcazars, Cuatro Vientos, Getafe, Madrid ECLB, and Seville are for aircraft service only. Public correspondence with *Ceuta* is limited to ships in the Straits of Gibraltar.
- (P) SWEDEN.
Boden and *Härnösand* stations are closed when navigation is suspended in the Gulf of Bothnia on account of ice.
Grundkallen and *Olandsrev* Lightships transmit to the coast messages received by means of flag signals from passing vessels or re-transmit to such vessels messages received from coast stations.
- (Q) TUNIS.
Seti-Meriem D.F. works in conjunction with *Bizerte-Seti-Meriem*.
- (R) UNITED STATES.
Bolinas is remotely controlled from *San Francisco KPH*, and *Marion WCC*, from *Chatham, Mass.*
- (S) ALASKA.
The stations at *Chignik, KHC, Kvichak, Naknek, Snag Point, and Uyak* are open from April to October, *Koglung KVV* from July 12th to August 20th.

INTERNATIONAL CALL LETTERS

Allotted to Countries of the World under the Radio Telegraphic Convention.

AAA to AMZ	Germany.	M	Great Britain.
ANA to APZ	Netherland Indies.	N	U.S.A.
AQA to AWZ	Norway.	OAA to OBZ	Peru.
AXA to AXZ	Poland.	OCA to OFZ	Great Britain.
AYA to AYZ	Venezuela	OGA to OIZ	Denmark
AZA to AZZ	Esthonia.	OJA to OJZ	Finland.
B	Great Britain.	OKA to OKZ	Czecho-Slovakia.
CAA to CEZ	Chili.	OLA to OMZ	Holland.
CFA to CKZ	British Possessions and Protectorate.	ONA to OTZ	Belgium and Colonies.
CLA to CMZ	Spain.	OUA to OZZ	Denmark.
CNA to CNZ	Morocco.	PAA to PIZ	Holland. (Home.)
COA to COZ	Great Britain.	PJA to PJM	Curaçao.
CPA to CPZ	Bolivia.	PJN to PJZ	Surinam.
CQA to CQZ	Monaco.	PKA to PMZ	Netherland Indies.
CRA to CRZ	Portuguese Colonies.	PNA to PPZ	Brazil.
CSA to CUZ	Portugal.	POA to PSZ	Portugal.
CVA to CVZ	Roumania.	PTA to PVZ	Brazil.
CWA to CWZ	Uruguay.	PWA to PWZ	Cuba.
CXA to CXZ	Spain.	PXA to PZZ	Holland. (Home.)
CYA to CZZ	Mexico.	Q	<i>Reserved for abbreviations.</i>
DAA to DSZ	Germany.	RAA to RQZ	Russia.
DTA to DIZ	Danzig (Free Town of).	RRA to RWZ	
DUA to DZZ	Germany.	RXA to RXZ	Republic of Panama.
EAA to EHZ	Spain and Colonies.	RYA to RYZ	Lithuania.
EIA to EZZ	Great Britain.	RZA to RZZ	
F	French Colonies and Protectorate.	SAA to SMZ	Sweden.
GAAA to		SNA to STZ	Brazil.
GWBB	Great Britain.	SUA to SUZ	Egypt.
GWBC to		SVA to SZZ	Greece.
GWJZ	Irish Free State.	TAA to TEZ	Turkey.
GWKA to		TFA to TFZ	Iceland.
GZZZ	Great Britain.	TGA to THZ	Greece.
HAA to HAZ	Hungary.	TIA to TOZ	Spain.
HBA to HBZ	Switzerland.	TPA to TUZ	Norway.
HCA to H CZ	Ecuador.	TVA to TZZ	Holland.
HDA to HEZ	Holland.	UAA to UMZ	France and Colonies and Protectorates.
HFA to HFZ	Serbs, Croates and Slovenes (Kingdom of).	UNA to UNZ	Serbs, Croates and Solvenes (Kingdom of).
HGA to HHZ	Siam.	UOA to UOZ	Austria.
HIA to HIZ	Dominican Republic.	UPA to UZZ	Italy.
HJA to HKZ	Columbia (Republic of).	VAA to VGZ	Canada.
HLA to HNU	Spain.	VHA to VKZ	Australian Commonwealth.
HNV to HNZ	New Hebrides.	VLA to VMZ	New Zealand.
HOA to HZZ	France and Colonies and Protectorates.	VNA to VNZ	Union of South Africa.
I	Italy and Colonies.	VOA to VOZ	Newfoundland.
J	Japan and Colonies. •	VPA to VSZ	British Colonies and Protectorates without autonomous Government.
KAA to KAY	Germany.	VTA to VWZ	British Indies and Persian Gulf.
KAZ	Danzig (Free Town of).	VXA to VZZ	British Colonies and Protectorates.
KBA to KBZ	Germany.	W	U.S.A.
KCA to KCZ	Lettonia (Latvia).	XAA to XDZ	Mexico.
KDA to KZZ	U.S.A.	XEA to XMZ	Great Britain.
LAA to LHZ	Norway.	XNA to XSZ	China.
LIA to LRZ	Argentine Republic.	XTA to XZZ	Great Britain.
LSA to LUZ	Great Britain.	Y	Great Britain.
LVA to LVZ	Guatemala.	Z	Great Britain.
LWA to LWZ	Norway.		
LXA to LZZ	Bulgaria.		

ALPHABETICAL LIST OF CALL SIGNS

ALLOTTED TO LAND STATIONS OF THE WORLD

(Local Call Signs in italics.)

ABBREVIATIONS USED.

(1) AGAINST NAME OF STATION

T = Radiotelephony only.

(T) = Radiotelephony in addition to Radiotelegraphy.

(2) UNDER NATURE OF SERVICE

A = Aviation.
B = Broadcast News, Concerts, etc.
Bea = Radio Beacon.
Cal = Calibration Waves.
DF = Direction Finding.
Dis = Distress Signals.
Exp. = Experimental.
FX = Corresponds with Fixed Stations only.
Nav = Navigational Warnings.

O = Official Correspondence only (including Naval and Military Stations).
P = Private Station.
PG = General Public Correspondence.
PR = Restricted Public Correspondence.
Pr = Press Messages.
Rec = Receiving only.
Sp = Special Service.
T = Time Signals.
W = Weather and Meteorological Reports.

An asterisk (*) indicates that these signals are only sent when necessary (e.g., Gale Warnings), or upon request from ships or aircraft.

NOTES: 1 = Station Temporarily Closed. 2 = Station under Construction or Projected.

For Particulars of Time Signals Weather Reports, Navigational Warnings, Radio Beacons, and Calibration Waves refer to **SCIENTIFIC SIGNAL SECTION**.

Call Sign.	Station.	Country.	Service	Call Sign.	Station.	Country.	Service.
Abbeville	Abbeville	France	A FX W	BVA	Helicon	Gt. Brit.	O
AD	Aerodrome			B	Satellite	Gr. Brit.	O
Ajaccio	Amsterdam AD ..	Holland	FX	BVC	Govan	Gt. Brit.	O
AKR	Ajaccio Aerodrome	Corsica	A FX W	BVD	Irwell	Gt. Brit.	O
Alger	Akobo	Sudan	O	BVE	Flying Fox ..	Gt. Brit.	O
Antibes	Algiers Aerodrome	Algeria	A	BVF	President	Gt. Brit.	O
ATR	Antibes Hydraviation (T)	France	A FX W	BVG	Berwick DF ..	Gt. Brit.	DF
AXJ	Atbara	Sudan	O	BVH	Hove	Gt. Brit.	O
AXK	Posen	Poland	FX	BVI	Caroline	Gt. Brit.	O
AXL	Grudziadz	Poland ..	FX Press	BVJ	R.N. College,, Dartmouth.	Gt. Brit.	O
AXM	Warsaw Rad. Cent.	Poland ..	FX	BVK	Castille	Malta ..	O
AXO	Warsaw Rad. Cent.	Poland ..	FX	BVN	Flamborough DF..	Gt. Brit.	DF
AXP	Warsaw Rad. Cent.	Poland ..	FX	BVY	Lizard DF	Gt. Brit.	DF
AYA	Cracow	Poland ..	FX	BWW	North Front ..	Gibraltar	O
AYB	Caracas (T)	Venezuela	PG	BXC	Chatham Admiralty House	Gt. Brit.	O
AYC	Maracay (T)	Venezuela	FX	BXF	Famagusta.. ..	Cyprus ..	O
AYD	Puerto Cabello (T)	Venezuela	PG	BXH	Orfordness DF ..	Gt. Brit.	Exp.
AYE	S. Christobal ..	Venezuela	FX	BXM	Chatham H.M.S.	Gt. Brit.	O
AYF	Porlamar	Venezuela	PG	BXO	Hecla		
AYG	Maracaybo.. ..	Venezuela	PG	BXW	Dolphin Fort ..	Gt. Brit.	O
AYH	La Quayra	Venezuela	PG	BXY	Blockhouse ..		
AZA	Barquisimeto ..	Venezuela	FX	BYA	Seletar	Singapore	O
AZI	Talinn (Revel) ..	Esthonia	PG W.	BYB	Stonecutters Island	Hong-Kg.	O
AZN	Haapsalu	Esthonia	Nav	BYC	Admiralty	Gt. Brit.	O
AZQ	Narva	Esthonia	FX	BYD	Cleethorpes Radio..	Gt. Brit.	O
AZR	Nekmangrund ..	Esthonia	PR	BYE	Horsea	Gt. Brit.	O
AZS	Lightship			BYF	Aberdeen	Gt. Brit.	O
AZU	Revalstein Lightship	Esthonia	PR	BYG	Ipswich	Gt. Brit.	O
AZX	Saritchev Lightship	Esthonia	PR	BYH	Pembroke	Gt. Brit.	O
BAV	Tartu	Esthonia	FX	BYI	Rosyth	Gt. Brit.	O
Biarritz	Reserve Lightship..	Esthonia	PR	BYJ	Sheerness	Gt. Brit.	O
BIA	Brussels	Belgium	B	BYK	Culver Cliff ..	Gt. Brit.	O
BTA	Biarritz Aerodrome	France	A	BYL	Portland Bill ..	Gt. Brit.	O
BUC	Bunla	Belgian Congo	—	BYM	Rame Head	Gt. Brit.	O
	Buta	Belgian Congo	—	BYN	Rock	Gibraltar	PR
	Bucharest Herastrau	R'mania	FX Pr W	BYO	S. Angelo	Malta	O W
				BYW	Rinella	Malta	O W
				BYX	Inchkeith D.F. ..	Gt. Brit.	Exp
				BYZ	Bermuda Dockyard	Bermuda	PG W

BZC	Portsmouth Signal School	Gt. Brit.	O	CRLS	Vila Henrique de Carvalho	Angola	FX
BZE	Matara ..	Ceylon	O W	CRM	Messanedes ..	Angola	PG
BZF	Aden Radio ..	Br. Smld.	PR W	CRN	Novo Redondo ..	Angola	PG
BZG	Mauritius ..	Mauritius	PG	CRO	Lobito ..	Angola	PG
BZL	Georgetown, Demerara	Br. Guiana	PG	CRP	Ambriz ..	Angola	PR
BZM	St. Johns ..	Newflnd.	O	Croydon	Croydon (T) ..	Gt. Brit.	A FX
BZQ	Christiania ..	Jamaica	—	Croydon	Croydon DF ..	Gr. Brit.	DF
BZR	Somerset Island ..	Bermuda	O	CRO	Cabinda ..	Angola	PG
Casa-	Casablanca	Morocco	A FX	CRR	Baia dos Tigres ..	Angola	FX
bianca	Aerodrome			CRS	S. Francisco, Macao	Macao ..	PG
Castle	Castle Bromwich	Gr. Brit.	A FX	CRT	Beira ..	Portugu se	PG
Brom.	Radio (T)			CRV	Mozambique ..	E. Africa	PG
CCA	Arica ..	Chile ..	PG	CRW	Quelimane ..	Portuguese	PG
CCB	Antofagasta ..	Chile ..	PG	CRX	Inhambane ..	E. Africa	PG
CCC	Coquimbo ..	Chile ..	PG	CRZ	Lourenco Marques	Portuguese	PG T W
CCD	Juan Fernandez ..	Chile ..	PG Pr	CTG	Cartagena ..	Colombia	PG
CCE	Valparaiso P. Ancha	Chile ..	O	CTV	Monsanto ..	Portugal	FX W
CCG	Santiago Moneda ..	Chile ..	Exp	CVAA	Constanta Tunnel	Roumania	O
CCH	Santiago University	Chile ..	A	CVAZ	Constanta Tunnel	Roumania	PR
CCI	Santiago Espejo ..	Chile ..	PG	CVB	Balcic ..	Roumania	O
CCK	Talcahuano Rocuant	Chile ..	Control	CVC	Cetatea-Alba ..	Roumania	O
CCL	Talcahuano Escuela de Torpedos	Chile ..		CVG	Galatz ..	Roumania	O
CCN	La Mocha ..	Chile ..	PG	CVK	Constanta ..	Roumania	O
CCO	Llanquihue ..	Chile ..	FX	CVLA	Bucharest ..	Roumania	FX
CCQ	Huao ..	Chile ..	PG	CVLB	Constanta ..	Roumania	O FX
CCR	Rio Aysen ..	Chile ..	PR	CVLE	Bucharest Herastrau	Roumania	—
CCS	Raper ..	Chile ..	PG	CVLF	Bucharest ..	Roumania	FX
CCV	Bories ..	Chile ..	PG	CVLG	Galatz ..	Roumania	FX
CCW	Punta Arenas	Chile ..	FX	CVLM	Bucharest ..	Roumania	—
CCX	Catalina			CVLO	Oradia Mare ..	Roumania	—
CCY	Punta Arenas	Chile ..	PR	CVLT	Timisoara ..	Roumania	—
CCZ	Apost. dero			CVM	Bucharest (Marine Inspectorate)	Roumania	O
CCY	Evangelistas ..	Chile ..	PR	CVME	Bucharest (Buc. 9)	Roumania	A
CCZ	Felix ..	Chile ..	PR	CVNA	Galatz ..	Roumania	O
CGI	Willis Islets ..	Australia	PG	CVNB	Bucharest (No. 5)	Roumania	—
CLM	Mahon CLM	Minorca	O	CVOB	Baneasa ..	Roumania	A
CLR	Madrid ..	Spain ..	O	CVOC	Cluj ..	Roumania	A
CLZ	La Carraca ..	Spain	O	CVS	Sulina ..	Roumania	O
CNA	Agadir ..	Morocco	PG	CVOS	Turnu Severin ..	Roumania	A
CNK	Kenitra-Gonjo ..	Morocco	DF	CWA	Cerrito ..	Uruguay	PG W
CNM	Mediouna, ..	Morocco	W	CWB	Isla de Lobos ..	Uruguay	PG
CNO	Casablanca	Morocco	A FX W	CWC	English Bank ..	Uruguay	PG
	Aerodrome			CWR	Rocha ..	Uruguay	—
CNP	Casablanca Cheteba	Morocco	DF	Didsbury	Didsbury .. (T)	Gt. Brit.	A FX
CNP	Casablanca Maroc	Morocco	PG DF	DG	Danzig ..	Danzig	W Nav
CNW	Tangier ..	Morocco	PG	EAA	Aranjuez ..	Spain ..	PG
CPA	Ballivian ..	Bolivia	—	EAB	Barcelona ..	Spain ..	PG
CPB	D'Orbigny ..	Bolivia	—	EAC	Cádiz ..	Spain ..	PG
CPC	Yacuiba ..	Bolivia	—	EAF	Cabo Finisterre ..	Spain ..	PG Bea
CPD	Esteros ..	Bolivia	—	EAL	Las Palmas ..	Canary Is.	PG
CPE	Riberalta ..	Bolivia	—	EAO	Soller ..	Majorca	PG
CPF	Viacha ..	Bolivia	—	EAP	Cabo de Palos ..	Spain ..	PG
CPG	Cobija ..	Bolivia	—	EAS	Cabo Mayor ..	Spain ..	PG
CPH	Villa Bella ..	Bolivia	—	EAT	Tenerife ..	Canary Is	PG
CPI	Trinidad ..	Bolivia	—	EAV	Vigo ..	Spain ..	PG
CPJ	S. Ana ..	Bolivia	—	EAY	S. Isabel de Fernan-	Fern'do Po	O
CRA	Bissau ..	Port. Gea.	PG	EBAW	Ferrol-Caranzo ..	Spain ..	DF
CRB	Bolama ..	Port. Gea.	PG	EBW	Ferrol ..	Spain ..	O
CRCC	Buzi ..	Port. E.A.	PG	EBX	Cartagena ..	Spain ..	O
CRD	S. Thomé ..	S. Thomas	PG	EBY	S. Fernando Cadiz	Spain ..	O
	Island			EBZ	Madrid EBZ ..	Spain ..	FX
CRE	Dili ..	Timor	PG	ECLA	Cuatro Vientos ..	Spain ..	A
CRF	S. Vicente de Cabo Verde	Caps Verde Islands	PG W	ECLB	Madrid-Direccion Aeronautica Militar	Spain ..	A
CRFF	S. Flipo ..	C. Verde I.	PG	ECLC	Getafe ..	Spain ..	A
CRGG	Brava ..	C. Verde I.	PR	ECLD	Los Alcázares ..	Spain ..	A
CRJ	Sal. Sta. Maria ..	C. Verde I.	PR	ECLE	Seville ..	Spain ..	A
CRK	Boa Vista, Sal. Rei.	C. Verde I.	PR	ECLF	Granada ..	Spain ..	A W
CRL	Praia ..	C. Verde I.	PG	ECLG	Nador (Melilla) ..	Morocco	A
CRL	Loanda ..	Angola	PG	EGA	Almeira ..	Spain ..	O
CRL	Huambo ..	Angola	FX	EGB	Melilla ..	Morocco	O
CRLM	Malange ..	Angola	FX				
CRIN	Lubango ..	Angola	FX				
CRLO	Dundo ..	Angola	FX				
CRLP	Camacupa ..	Angola	FX				
CRLQ	S. Antonio de Zaire	Angola	FR				

EGC	Madrid, EGC	Spain	O	FNL	Lyon Aerodrome	France	A FX W
EGD	Ceuta	Morocco	O	FNM	Marignane	France	A FX W
EGE	Barcelona	Spain	O		Aerodrome		
EGF	Larache	Morocco	O	FNN	Nîmes Aerodrome	France	A FX W
EGG	Valencia	Spain	O	FNP	Perpignan	France	A FX W
EGH	Bilbao	Spain	O		Aerodrome		
EGI	Mahon, EGI	Minorca	O	FNQ	Montelimar	France	A FX W
EGJ	Coruña	Spain	O		Aerodrome		
EGK	Tetuán	Morocco	O	FNR	Romilly Aerodrome	France	A FX W
EGL	Cabo Juby	Morocco	O	FNS	Strasbourg	France	A FX W
EGM	Málaga	Spain	O		Aerodrome		
EGN	Villa Cisneros	Rio de Oro	O	FNT	Toulouse	France	A FX W
EGO	Alhucemas	Morocco	O		Aerodrome		
EGP	Peñón de Velez de la Gomera	Spain	—	FNU	Tunis Hydraviation	Tunis	A FX
EGY	Ministry of War	Spain	O	FNV	Valenciennes	France	A FX W
EIZ	Oran	Spain	O		Aerodrome		
FCQ	Falcaragh	Irish F.S.	—	FNX	Bordeaux	France	FX W
FEB	Bermées-Gonio	France	DF		Aerodrome		
FEC	Agde	France	DF	FNZ	French Aerodromes	France	General Call
FED	Berre - Bouches - du-Rhône	France	O	FOA	Algiers Aerodrome	Algiers	A W FX
FEE	Lorient Aviation	France	O	FOO	Oran Aerodrome (T)	Algeria	A FX
FEF	Le Palyvestre Aviation	France	O	FOT	Toulouse Aerodrome (T)	France	A FX
FEG	Guipavas-Gonio	France	DF	FSB	Hellville	M'gascar	FX
FEI	Moulin-du-Seigneur Gonio	France	DF	FSR	Kasher	Sudan	O
FEJ	Diidjelli-Gonio	Algeria	DF	FUA	Bizerte-Sidi-Abdallah	Tunis	O W
FEK	Oran-La-Senia Aerostation	Algeria	A O	FUB	Bizerte-Carouba	Tunis	O
FEM	La Mitré-Gonio	France	DF	FUC	Cherbourg-Gonio	France	DF
FEP	Penmarch-Gonio	France	DF	FUC	Cherbourg-Rouges-Terres	France	PG W
FEQ	Setié-Meriem Gonio	Tunis	DF	FUD	Dunkerque	France	Nav*
FER	Pointe-du-Raz-Gonio	France	DF	FUE	Castelnau	France	PR W*
FES	Soubise-Gonio	France	DF	FUF	Mengam	France	PR W
FET	Tréguier-St.-Gonery-Gonio	France	DF	FUG	S. Raphaël	France	Nav
FEU	Ushant (Niou Huella)	France	DF	FUH	Aubagne	France	O
FEX	La Mitré Gonio	France	DF	FUI	Hourtin	France	O
FEZ	S. Nazarre-Gonio	France	DF	FUJ	Ajaccio-Aspretto	Corsica	O
FFA	Alger T.S.F.	Algeria	PG W	FUK	Algiers-Baraki	Algeria	O
FFB	Boulogne-sur-Mer T.S.F.	France	PG W*	FUL	Oran-ain-el-Turck	Algeria	PG W
FFC	Bonifacio T.S.F.	Corsica	Nav*	FUM	Beyrouth-Djedeide	Syria	Nav
FFD	Beyrouth TSF	Syria	PG	FUN	Montebourg Aero Station	France	O
FFH	Havre T.S.F.	France	PG W*	FUN	Lorient DF	France	DF
FFI	Dieppe	France	PR	FUO	Lorient-Pen-Mané	France	PG
FFM	Marseille T.S.F.	France	Nav*	FUP			Nav
FFN	Nice T.S.F.	France	PG W*	FUQ	Cuers-Pierrefeu	France	O
FFS	S. Maries de la Mer T.S.F.	France	PR	FUR	Cherbourg Aviation	France	O
FFU	Ushant T.S.F.	France	PG W*	FUT	Porquerolles	France	O W
FFW	Bizerte-Setié-Meriem	Tunis	Nav*	FUV	Rocheport-sur-Mer	France	PG
FFX	Bordeaux T.S.F.	France	PG W*	FUZ	Toulon-Mourillon	France	Nav*
FFZ	Shanghai-Zikawei	China	Nav	FUA	Brest Aviation	France	O W DF
FL	Eiffel Tower (T)	France	PG T W	GB	Rouen Port	France	O
FLZ	Raz. Beyrouth	Syria	FX T W	GBL	Havre Abeilles	France	P
FMA	Monrovia	Liberia	Cal.	GCA	Havre-Port (Le)	France	P
FNA	Algiers Aerodrome	Algeria	Pr B	GCB	S. Cyr Aero Station	France	A O
FNB	Le Bourget (T)	France	O	GCC	Quang-Tcheou Wan	China	PG
FNC	Nancy Aerodrome	France	PG	GCK	Glacé Bay	Canada	FX
FND	Dijon Aerodrome	France	A FX	GCS	Oxford (Leafield)	Gt. Brit.	PR
FNG	St. Ingouven (T)	France	W. Cal.	GDX	Tobermory	Gt. Brit.	FX
FNH	Havre Aerodrome	France	A FX W	GEC	Lochboisdale	Gt. Brit.	FX
FNI	Abbeville Aerodrome (T)	France	A FX	GED	Cullercoats	Gt. Brit.	PG DF
FNJ	Ajaccio Aerodrome (T)	Corsica	A	GEG	Valentia Radio	Ireland	Nav W
FNK	Antibes Aerodrome (T)	France	W	GEK	Caister-on-Sea	Gt. Brit.	PG Nav
			A FX	GEL	Isle of Man	Gt. Brit.	W
			W	GEM	Castle Bromwich	Gt. Brit.	FX
					Radio (T)		A FX
					Croydon (T)	Gt. Brit.	DF
					Lympe (T)	Gt. Brit.	A FX
					Cologne	Germany	O
					Lerwick	Gt. Brit.	A FX
					Didsbury (T)	Gt. Brit.	A FX W

GEP	Pulham DF (T) ..	Gt. Brit.	DFAFX	HC1	runá, Guayas ..	Ecuador	PG
GER	Renfrew (T) ..	Gt. Brit.	A FX W	HCQ	Quito ..	Ecuador	FX
GEY	Guernsey (T) ..	Gt. Brit.	A FX	HFB	Belgrade Banjitzá	Ugo-Slavia	FX W
GEZ	GEZ ..	Gt. Brit.	Gen. Call	HFC	Saraievo ..	Ugo-Slavia	FX
			for Brit.	HFD	Belgrade Rakovitzá	Ugo-Slavia	FX
			Aircraft	HFE	Belgrade Rakovitzá	Ugo-Slavia	FX
GFA	Air Ministry, L'nd'n	Gt. Brit.	A FX	HFF	Belgrade Rakovitzá	Ugo-Slavia	FX
			W T	HFS	Skoplje ..	Ugo-Slavia	FX
GFC	Cranwell ..	Gt. Brit.	A FX	HGA	Bangkok ..	Siam ..	PG
GFD	Leuchars ..	Gt. Brit.	A FX	HGB	Singora ..	Siam ..	PG
GFG	Isle of Grain ..	Gt. Brit.	A FX	HGK	Kohkham ..	Siam ..	PG
GFH	Duxford ..	Gt. Brit.	A FX	HGR	Red Lightship ..	Siam ..	PG
GFI	Andover, Hants ..	Gt. Brit.	A FX	HIB	La Romana ..	Dom Rep.	PG
GFK	Donibristle ..	Gt. Brit.	O	HJA	San Andres ..	Colombia	FX
GFL	Calshot ..	Gt. Brit.	A FX	HJB	Puerto Colombia ..	Colombia	PG
GFM	Cattewater ..	Gt. Brit.	A FX	HJC	Baranquilla ..	Colombia	PG
GFN	Bircham Newton ..	Gt. Brit.	A FX	HJD	Medellin ..	Colombia	PG
GFO	Sealand ..	Gt. Brit.	A	HJE	Cali ..	Colombia	PG
GFP	Gosport, Hants ..	Gt. Brit.	A FX	HJF	Cacuta ..	Colombia	PG
GFO	Farnborough ..	Gt. Brit.	A FX	HJG	Bogota ..	Colombia	FX
GFR	Flowerdown ..	Gt. Brit.	A FX	HVA	Hanoi ..	Fr. Indo	PG W
GFS	Spittlegate ..	Gt. Brit.	A FX			China	
GFS	Felixstowe ..	Gt. Brit.	W	HVB	Kien-An ..	F.I.Ch na	PG T
GFT	Old Sarum ..	Gt. Brit.	A FX				W DF
GFU	Uxbridge ..	Gt. Brit.	A FX	HVC	C c-Ba ..	F.I.China	DF FX
GFV	Lee-on-the-Solent ..	Gt. Brit.	A FX	HVD	Moncay ..	F.I.China	PG
GFX	Netheravon ..	Gt. Brit.	A FX	HVE	Fori Bayard ..	F.I.China	1 G W
GFY	Henlow ..	Gt. Brit.	A FX	HVI	Tourane ..	F.I.China	PG W
GGB	Aldershot ..	Gt. Brit.	FX	HVM	Myo-'ho ..	F.I.China	PG W
GGC	Riehl ..	Germany	FX	HVO	Poulo Condore ..	F.I.China	PG W
GHA	Calafra ..	Malta	A FX W	HVP	Phu-Quoc ..	F.I.China	1 G W
GKB	Northolt ..	Gt. Brit.	FX	HVW	Port-Vila ..	New	PG
GKG	Hevsham Harbour ..	Gt. Brit.	P			Hebrides	
GKH	North Ronaldshay ..	Gt. Brit.	FX	HVX	Papeete, Ile Tahiti	Franch	PG W
GKJ	Sa day ..	Gt. Brit.	FX			Oceania	Nav
GKR	Wick ..	Gt. Brit.	PG Nav	HVY	Makatea ..	Fr.Oceania	PG FX
			W	HWB	Dakar ..	Fre on W	PG
GKU	Devizes ..	Gt. Brit.	PR W			Africa	Nav
GKZ	Grimsby ..	Gt. Brit.	PG W	HWC	Rufisque ..	F. W. Af.	PG
GLA	Ongar ..	Gt. Brit.	FX	HWD	Conakry ..	F. W. Af.	PG
GLB	Ongar ..	Gt. Brit.	FX				Nav
GLC	Carnarvon ..	Gt. Brit.	FX	HWF	Tatou ..	F. W. Af.	PG
GLD	Lands End ..	Gt. Brit.	PG W	HWG	Grand Bassam ..	F. W. Af.	PG
			Nav*	HWH	Cotonou ..	F. W. Af.	PG
GLO	Ongar ..	Gt. Brit.	FX	HWI	Port Etienne ..	F. W. Af.	PG
GLP	Ongar ..	Gt. Brit.	FX	HWL	Bamako ..	F. W. Af.	FX
GLV	Seathorth ..	Gt. Brit.	PG Nav	HWZ	Douala ..	French	PG
			W*			Camer'ns	
GMR	Malin Head ..	Ireland..	PG W	HYD	Diego-Suarez ..	M'dg'scar	PG W
			Nav				FX
GMR	Gambela ..	Sudan	O	HYE	Majunga ..	M'dg'scar	PG W
GNF	North Foreland ..	Gt. Brit.	PG Nav	HYG	Mutsamudu ..	M'dg'scar	1 G
			W*	HYH	Dzaoudzi ..	M'dg'scar	PG W
GNI	Niton ..	Gt. Brit.	PG Nav	HYI	M'Dé ..	M'dg'scar	PG FX
			W*	HYL	Tamatave ..	M'dg'scar	W
GNR	Geneina ..	Sudan ..	O	HYM	Ilot Madame ..	M'dg'scar	FX
GNV	N whaven ..	Gt. Brit.	X	HYO	St. Denis ..	Réunion	PG
GOA	Antigua ..	Br.W.Ind	FX	HYS	S. Pierre ..	S. Pierre	1 G FX
GPK	Port Patrick ..	Gt. Brit.	PG W*	HYT	Miquelon ..	Miquelon	FX
			Nav*	HYU	Destrellan ..	Gu'd'loupe	PG
GPO	Parkeston Quay ..	Gt. Brit.	P	HYW	Cayenne ..	French	1 G
GRL	Fishguard ..	Gt. Brit.	PG W*			Guiana	
			Nav*	HZA	Saigon, Phu-Tho ..	F.I.China	FX T
GRN	Rathlin Is. ..	Gt. Brit.	FX	HZD	Tananarive (Antan- rivo)	M'gascar	—
GSL	Ballycastle ..	N. Ireland	FX				
GSW	Stonehaven ..	Gt. Brit.	FX	HZE	Djibouti ..	Fr. Somal.	PG
Guerns'y	Guernsey (T) ..	Gt. Brit.	A FX	HZG	Numéa-Semaphore	New Cale- donia	PG
GUR	Folkestone Harbour ..	Gt. Brit.	P				
				HZH	Fort de France ..	Martinique	PG O
HAR	Szekesfehervar ..	Hungary	FX	HZL	Pointe Noire ..	French	PG
HB	Csepel ..	Hungary	FX W			Congo	
HB 1	Genève-Cointrin (T)	Switz'l'd	A FX B	ICA	Aspio ..	Italy ..	PG W*
HB 1	Lausanne-Champ- de-l'Air	Switz'l'd	A FX	ICB	Genoa ..	Italy ..	PG
			W	ICC	Coltano ..	Italy ..	FX
HBA	Berne ..	Switz'l'd	FX	ICD	Roma Centocelle ..	Italy ..	Sp
HBB	Berne ..	Switz'l'd	FX	ICE	Brindisi ..	Italy ..	W*
HBK	Kloten, Dubendorf ..	Switz'l'd	A W	ICF	Messina ..	Sicily	PG O
HBZ	Zurich-Höngg ..	Switz'l'd	B				W*
HCE	Esmeraldas ..	Ecuador	PG	ICG	Pantelleria ..	Italy (Isd.)	FX
HCG	Guavaquil ..	Ecuador	PG	ICH	Maddalena ..	Italy ..	PG W*
HCM	Machala ..	Ecuador	—	ICI	Coltano, G. Marconi	Italy ..	FX

ICJ	Bengazi	Cyrenaica	PG	JOS	Osezaki	Japan	PG
ICK	Tripoli	Trip'tana	PR O*	JSA	Kasajima	Japan ..	PR
ICL	Lamped isa	Italy ..	FX	JSB	Shogetsu (Lt'ho)	Japan ..	PR FX
ICN	Naples	Italy ..	PG O	JSDA	Shiba (Tokio) ..	Japan ..	PR
			W*	JSM	Shiomisaki	Japan ..	PG
ICO	Derna	Cyrenaica	PG	JSS	Shoseito (Lightho)	Japan ..	PR FX
ICP	Palermo	Sicily	PG W*	JSX	Shimotsui	Japan ..	PG
ICQ	S. Cataldo di Bari	Italy ..	PG O	JTJ	Kaiyo Met. Obs. ..	Japan ..	W Nav
			W*		(Kobe)		
ICR	Capo Sperone ..	Sardinia	PG W*	JTS	Tsunoshima	Japan ..	PG
ICS	Spezia	Italy ..	O W*	JTW	Otomari	Japan ..	DF
ICT	Taranto	Italy ..	O W*	JYU	Minamioagarijima	Japan ..	Japanese
ICU	Tobrukh	Cyrenaica	PG				stns. only
ICV	Vittoria	Sicily	PG W*	KAF	Amrum Bk. Lightp	Germany	PR
ICW	Rhodes	Dodecanese	PG W	KAG	Adlergrund Lightp.	Germany	PR
ICX	Massaua ICX ..	Eritrea	FX T	KAH	Heligoland	Germany	PG
ICY	Assab	Eritrea	PG	KAI	Norderney L'tship	Germany	PR
ICZ	Venice	Italy ..	PG O	KAJ	Ausseneider L'ship	Germany	PR Nav
			W*	KAL	List	Germany	PR
IDA	Stampalia	Dodecanese	W*	KAN	Wilhelmshaven ..	Germany	O
IDB	Saeno	Albania	O W*	KAO	List Lt. V.	Germany	DF
IDD	Lipari	Italy (Isd.)	W*	KAP	Pilau Lightship ..	Germany	PR W
IDE	Stromboli	Italy (Isd.)	W*				Nav
IDH	Cotrone	Italy ..	PG W*	KAR	Neumünster Lt. V.	Germany	O
IDK	Leghorn	Italy ..	FX W*	KAT	Arngast Lighthouse	Germany	PR
IDL	Civitavecchia ..	Italy ..	PG W*	KAU	Assenjade Light'p	Germany	PR
IDN	Cirene (Taukra) ..	Cyrenaica	PG	KAV	Norddeich (T) ..	Germany	PG W
IDO	Rome San Paolo ..	Italy ..	Sp W				Nav
IDR	Tempio	Sardinia	PG O	KAW	Swinemünde	Germany	PG
			W*				Nav W
IDS	Ustica	Italy (Isd)	FX	KAY	Stolpmünde	Germany	O
IDW	Trik Gefara ..	Trip'tana	PG	KAZ	Danzig	Danzig ..	PG W
IFM	Messina	Sicily ..	FX				Nav
IFR	Reggio Calabria ..	Italy ..	FX	KBC	Fehmarnbelt Lightp	Germany	PR
IFV	Villa San Giovanni	Italy ..	FX	KBD	Kalkgrund Lightship	Germany	PR
IQB	Fiume	Fiume	PG FX	KBE	Warnemünde	Germany	PR
IQL	Smyrna Harbour ..	Smyrna	O	KBF	Elbe Lightship ..	Germany	PR
		(Italian)		KBH	Bremernaven Lloyd-	Germany	PR
					halle		
IOW	Ancona IQW ..	Italy ..	O W*	KBI	Kiel Lightship ..	Germany	PR
IQX	Trieste	Italy ..	PG O	KBK	Kiel-Friedrichsort	Germany	PG W
			W*				Nav*
IQZ	Pola	Italy ..	PG O	KBL	Eidergaliote	Germany	PR Nav
			W*		Lightship		
IRG	Massaua IRG ..	Eritrea	PG	KBM	Borkum	Germany	PR DF
IRM	Murano DF	Italy ..	DF	KBN	Nordholz Lightship	Germany	PR DF
IRT	Mersa Fatma ..	Eritrea	FX	KBO	Borkum Lt. V. ..	Germany	DF
ISA	Giohar	It. Somal.	FX	KBQ	Nordholt Lt. V. ..	Germany	DF
ISB	Merka	It. Somal.	PG	KBR	Borkum Riff Lightp	Germany	PR
ISC	Brava	It. Somal.	PG	KBU	Stralsund	Germany	O
ISD	Giumbo	It. Somal.	PG	KBV	Sassnitz	Germany	PR
ISE	Mogadiscio ISE ..	It. Somal.	PG	KBW	Weser Lightship ..	Germany	PR
ISF	Mahaddei Uea ..	It. Somal.	FX	KBX	Cuxhaven	Germany	PG Nav*
ISG	Mogadiscio I-G ..	It. Somal.	Sp.T	KBY	Warnemünde Lt. V.	Germany	O
ISH	Iscia Baidoa	It. Somal.	FX	KCA	Riga	Latvia ..	PG W
ISI	Oddur	It. Somal.	FX				Nav
ISJ	Bulo Burti	It. Somal.	FX	KCB	Liepaja	Latvia ..	PG W
ISM	Itala	It. Somal.	PG				Nav
ISN	Bardera	It. Somal.	FX	KCC	Ventspils	Latvia ..	O PR
ISO	Lugh	It. Somal.	FX	KCQ	Leipaja	Latvia ..	FX W
ISP	Haifun Dante Ali-	It. Somal.	PG	KDAH	Fairport	U.S.A. ..	FX
	ghieri			KDC	Casper (T)	U.S.A. ..	FX
ISQ	Obbia	It. Somal.	PG	KDEF	Omaha	U.S.A. ..	A
				KDEG	Cheyenne	U.S.A. ..	A
JAA	Iwaki	Japan	—	KDEH	S. I. Lake City ..	U.S.A. ..	A
JBY	Kanazawa	Japan	PR	KDEJ	Elko	U.S.A. ..	A
JCS	Choshi	Japan	PG T	KDEK	Reno	U.S.A. ..	A
			W.	KDEL	Brian	U.S.A. ..	O
JCX	Nawa	Japan	—	KDEP	Northville	U.S.A. ..	FX
JDA	Dairenwan	Japan ..	O PG W	KDEA	Hyder	Alaska ..	PG
JFK	Keelung	Japan	PG W	KDGF	Quincy	U.S.A. ..	P
JFQA	Wakkanai	Japan	DF	KDHM	North Platte	U.S.A. ..	A
JHJ	Horomushiro ..	Japan	PG	KDHN	Rock Springs ..	U.S.A. ..	A
JJC	Funabashi	Japan	O T	KDJT	Daly	Alaska ..	FX
JKM	Komonto (Lightho.)	Japan	PR FX	KDJU	Warren	Alaska ..	FX
JMAA	Keijo	Japan	—	KDKA	East Pittsburgh (T)	U.S.A. ..	FX
JMD	Hozen	Japan	PG	KDN	Kukak Bay	Alaska ..	FX
JMP	Mokuho	Japan	PR FX	KDNU	Fresno	U.S.A. ..	FX
JMZ	Maizuru	Japan	PG	KDP	Chomly	Alaska ..	FX
JN	Jan Mayen	Norway	W	KDPH	Detroit, KDPH ..	U.S.A. ..	PR
JNY	Ishikari	Japan	PR	KDPI	Superior	U.S.A. ..	PR
JOC	Otchishi	Japan	PG				

KDPJ	Marysville ..	U.S.A. ..	FX	KKAI	Hawk Inlet ..	Alaska ..	FX
KDPM	Cleveland KDPM (T)	U.S.A. ..	FX B	KKAO	Kussilof ..	Alaska ..	FX
KDPS	Baytown ..	U.S.A. ..	FX	KKP	Anvik (T) ..	Alaska ..	FX
KDPU	Cascada ..	U.S.A. ..	FX	KLB	Portland, Oregon ..	U.S.A. ..	FX
KDPV	Camp 60 ..	U.S.A. ..	FX	KLD	Kenai KLD ..	Alaska ..	FX
KDPW	Camp 61 ..	U.S.A. ..	FX	KLJ	Nushagak Bay ..	Alaska ..	FX
KDOA	Maywood ..	U.S.A. ..	A	KLN	Hilo ..	Hawaiian Islands	FX
KDQC	S. Francisco KDQC	U.S.A. ..	O	KLP	Big Creek Power House	U.S.A. ..	FX
KDRH	Ruby KDRH ..	Alaska ..	FX	KLW	Port Althorp ..	Alaska ..	FX
KDTS	Iowa City ..	U.S.A. ..	O	KMC	Kassan ..	Alaska ..	FX
KDU	Point Reyes ..	U.S.A. ..	FX	KMF	Egekik ..	Alaska ..	FX
KEA	Seldovia ..	Alaska ..	PG	KMG	Ekuk ..	Alaska ..	FX
KED	Siassi ..	Phil. Is. ..	PG	KMK	Naknek KMK ..	Alaska ..	FX
KEK	Hillsboro KEK ..	U.S.A. ..	PG	KML	Lockanok ..	Alaska ..	FX
KEO	Bongoa ..	Phil. Is. ..	PG	KMT	Libbyville ..	Alaska ..	PG
KEPS	Lazy Bay ..	Alaska ..	FX	KMU	Ugashik ..	Alaska ..	FX
KEQ	Port Walter ..	Alaska ..	PG	KMW	Akutan KMW ..	Alaska ..	FX
KET	Bolinas KET ..	U.S.A. ..	PR	KNP	Chignik, KNP ..	Alaska ..	FX
KEV	Cagayan de Sulu ..	Phil. Is. ..	PG	KNR	Clearwater KNR ..	U.S.A. ..	FX
KEW	Balabac ..	Phil. Is. ..	PG	KO	Königsberg ..	Germany ..	W
KFC	Pvbus Bay ..	Alaska ..	FX	KOG	Honolulu KOG ..	Hawaiian Islands	PG
KFGH	Stanford Univ. T.	U.S.A. ..	FX B	KOK	Clearwater, KOK ..	U.S.A. ..	PG
KFL	Underwood ..	U.S.A. ..	FX	KON	Union Bay ..	Alaska ..	PG
KFM	Camp 61 (C) ..	U.S.A. ..	FX	KOR	Quandra KOR ..	Alaska ..	FX
KFN	Cape Chacon ..	U.S.A. ..	P	KOSC	Tenakee ..	Alaska ..	PR
KFR	Cedar Falls ..	U.S.A. ..	FX	KOV	Carlisle ..	Alaska ..	PG
KFRD	Avalon ..	U.S.A. ..	FX	KOXN	Pirate Cove ..	Alaska ..	PG
KFRE	Wilmington ..	U.S.A. ..	FX	KPB	Amuguis ..	Phil. Is. ..	PG
KFS	S. Francisco KFS	U.S.A. ..	PG	KPC	Batangas ..	Phil. Is. ..	PG
KFT	Everett ..	U.S.A. ..	PG	KPE	Seattle KPE ..	U.S.A. ..	PG
KFU	Pearl Creek Dome	Alaska ..	P	KPH	Bolinas (S. Frans.)	U.S.A. ..	PG
KFV	Los Angeles KFV ..	U.S.A. ..	FX	KPI	S. Francisco KPI ..	U.S.A. ..	PG
KFZ	Los Angeles KFZ ..	U.S.A. ..	P	KPJ	Cebu ..	Phil. Is. ..	PG
KGA	Kigoma ..	Belgian Congo	—	KPM	Culion ..	Phil. Is. ..	PG
KGA	Oakland ..	U.S.A. ..	P	KPN	Iloilo ..	Phil. Is. ..	PG
KGC	Kanatak ..	Alaska ..	FX	KPV	Isabela de Basilan	Phil. Is. ..	PG
KGF	Candle (T) ..	Alaska ..	FX	KPW	Malangas ..	Phil. Is. ..	PG
KGH	Hill boro' KGH ..	U.S.A. ..	FX	KPX	Lebak ..	Phil. Is. ..	PG
KGI	Kahuku KGI ..	Hawaiian Islands	PR	KPY	S. Francisco, Camotes	Phil. Is. ..	PG
KGV	Los Angeles KGV ..	U.S.A. ..	P	KPZ	Mati ..	Phil. Is. ..	PG
KHA	Uyak KHA ..	Alaska ..	FX	KQI	Hunters Bay ..	Alaska ..	FX
KHB	Kvichak KHB ..	Alaska ..	FX	KQL	Hidden Inlet ..	Alaska ..	PG
KHC	Chignik KHC ..	Alaska ..	FX	KOP	Tee Harbor ..	Alaska ..	FX
KHD	Quadra KHD ..	Alaska ..	FX	KOY	Vestal Sub-station	U.S.A. ..	FX
KHF	Snag Point ..	Alaska ..	FX	KRFE	Wilmington (Calif.)	U.S.A. ..	FX
KHG	Clark's Point ..	Alaska ..	FX	KRNS	Kronstadt ..	Russia ..	Nav
KHH	S. Francisco KHH	U.S.A. ..	FX	KRQ	Kaumapalapau ..	Hawaiian Islands	FX
KHI	Squaw Harbour ..	Alaska ..	PG	KRU	Yes Bay ..	Alaska ..	FX
KHK	Wahiawa ..	Hawaiian Islands	PG	KRX	Chichagof ..	Alaska ..	PG
KHL	Wailuku ..	Hawaiian Islands	FX	KRY	Big Creek ..	U.S.A. ..	P
KHM	Lihue ..	Hawaiian Islands	FX	KSC	Katalla ..	Alaska ..	PG
KHN	Kawaihae ..	Hawaiian Islands	FX	KSE	Wilmington ..	U.S.A. ..	PG
KHO	Kaunakakai ..	Hawaiian Islands	FX	KTA	S. Francisco KTA	U.S.A. ..	P
KHT	Naknek KHT ..	Alaska ..	FX	KUBX	Koggiung KUBX	Alaska ..	FX
KHV	Uyak KHV ..	Alaska ..	FX	KUCP	Chisik Island ..	Alaska ..	FX*
KIE	Kahuku KIE ..	Hawaiian Islands	PR	KUDT	Pilot Point ..	Alaska ..	FX
KIF	Davao ..	Phil. Is. ..	PG	KUDV	Becharof ..	Alaska ..	FX
KII	S. Francisco KII ..	U.S.A. ..	P	KUVQ	Johnswood ..	U.S.A. ..	FX
KIL	Jolo ..	Phil. Is. ..	PG	KUVS	New York, KUVS	U.S.A. ..	P
KIM	Latouche ..	Alaska ..	PG	KUXM	Cheboygan ..	U.S.A. ..	FX
KIV	Puerto Princesa ..	Phil. Is. ..	PG	KVI	Unga ..	Alaska ..	FX
KIW	Zamboanga ..	Phil. Is. ..	PG	KVQ	Kvichak ..	Alaska ..	FX
KIX	Cuyo ..	Phil. Is. ..	PG	KVT	Los Angeles KVT	U.S.A. ..	PR
KIY	S. José, Mindoro ..	Phil. Is. ..	PG	KVU	S. Diego KVU ..	U.S.A. ..	FX
KIZ	Malabang ..	Phil. Is. ..	PG	KVV	Koggiung KVV ..	Alaska ..	FX
KJA	Pysht (T) ..	U.S.A. ..	P	KVW	Seattle KVW (T) ..	U.S.A. ..	FX
KJC	Rose Inlet ..	Alaska ..	FX	KWH	Los Angeles KWH (T)	U.S.A. ..	FX B
KJJ	Tree Point Lightho.	Alaska ..	P	KWO	Port Beauclair ..	Alaska ..	FX
KJK	King Cove ..	Alaska ..	PG	KWQ	Saltchuck ..	Alaska ..	FX
KJL	False Pass ..	Alaska ..	FX	KWR	Port Moller ..	Alaska ..	PR
KKA	Yakutat ..	Alaska ..	FX	KWS	Lost Harbor ..	Alaska ..	FX
KKAE	Mushagak ..	Alaska ..	FX	KWT	Palo Alto ..	U.S.A. ..	FX
				KWW	Radioville ..	Alaska ..	PG

KXD	Siginaka Island ..	Alaska	FX	LJF	Rio Grande Tierra	Argentine	PG
KXK	Funter ..	Alaska ..	FX		del Fuego		
KXS	Red Bluff Bay ..	Alaska	FX	LJK	Recalada Lt. V. ..	Argentine	PG
KXV	Nelson Lagoon ..	Alaska ..	FX	LJL	Interseccion Rio de	Argentine	O
KXW	Ikatan ..	Alaska ..	FX		la Plata Ponton		
KYB	Honolulu KYB ..	Hawaiian	FX	LJM	Recalada Bahia Blan.	Argentine	O
		Islands			Ponton Lgt.		
KYF	Wichita ..	U.S.A. ..	FX	LNA	Dir. Gen. of Arsenals	Argentine	O
KYG	Laguna Bell Sub-	U.S.A. ..	FX	LNC	Cordoba ² ..	Argentine	O
	Station			LND	Palomar (Fl) ..	Argentine	O
KYI	Culver City KYI T	U.S.A. ..	FX	LNG	Military Coll. ..	Argentine	O
KYJ	Culver City KYJ T	U.S.A. ..	FX	LNL	Liniers ..	Argentine	O
KYK	Karluk ..	Alaska ..	FX	LNM	Mendoza ..	Argentine	O
KYL	Alitak ..	Alaska ..	FX	LNR	Com. 1st Army Div.	Argentine	O
KYV	Pillar Bay ..	Alaska	FX	LNS	Com. 2nd Army Div.	Argentine	O
KYX	Los Angeles KYX	U.S.A. ..	FX	LNT	Tucuman ² ..	Argentine	O
KYY	Los Angeles KYY	U.S.A. ..	FX	LP	Konigs-Wusterhau-	Germany	FX W
KYZ	Kenai ..	Alaska	P		sen		
KZAB	Basco ..	Phil. Is.	PG	LPA	Rosalia de Santa Fé	Argentine	O
KZAC	Calapan ..	Phil. Is.	PG	LPB	Parana ..	Argentine	O
KZAD	Aparri ..	Phil. Is.	PG	LPC	Corrientes LPC ..	Argentine	O
KZAG	S. Vicente, Lucon	Phil. Is.	PG	LPD	Puerto Bermejo ..	Argentine	O
KZAH	Virac ..	Phil. Is.	PG	LPZ	Monte Grande ..	Argentine	FX
KZAJ	Legaspi ..	Phil. Is.	PG	LWP	Bear Island ..	Norway	P
KZC	Parsons ..	U.S.A. ..	FX	LY	Bordeaux Lafayette	France	FX T
KZE	Aberdeen ..	U.S.A. ..	PR		T.S.F.		Pr Cal
KZI	Los Angeles KZI ..	U.S.A. ..	FX	Lympne	Lympne Radio ..	Gt. Brit.	A FX
KZR	Dillard ..	U.S.A. ..	FX	LZF	Varna ..	Bulgaria	PG
KZY	Culver City KZY ..	U.S.A. ..	P				
LBX	Ramsund ..	Norway	O	MFT	Clifden ¹ ..	Ireland	FX
LBY	Forsvartsdepart-	Norway	O	MGR	Mongalla ..	Sudan	O
	mentets RS			MLR	Malakal ..	Sudan	O
LBZ	Karljohansvern ..	Norway	O	MPD	Poldhu ..	Gt. Brit.	Exp
LCH	Oslo ..	Norway	W FX	MU	Carnarvon ..	Gt. Brit.	FX
			PR	MZX	Chelmsford ..	Gt. Brit.	P
LCM	Stavanger ..	Norway	FX	NAA	Washington NAA ..	U.S.A. ..	O W
LDB	Vaerøy ..	Norway	FX				T Press
LDF	Flekkerøy ..	Norway	PG W	NAB	Cape Elizabeth ..	U.S.A. ..	DF
			Nav	NAC	Portsmouth ..	U.S.A. ..	O
LDW	Fauske ..	Norway	PG Nav	NAD	Boston NAD ..	U.S.A. ..	O Nav
Le	Le Bourget	France	A Cal.				W T
Bourget	Aerodrome FNB (T)			NAE	North Truro ..	U.S.A. ..	DF
LEI	Ingøy ..	Norway	PG W	NAF	Newport Rhode Is.	U.S.A. ..	O T
			DF	NAH	New York NAH ..	U.S.A. ..	O W
LEK	Vardö ..	Norway	PG W	NAI	Philadelphia NA1 ..	U.S.A. ..	Nav T
LEN	Sörvagen ..	Norway	PG Nav				W
LET	Tjömö ..	Norway	PG W	NAJ	Great Lakes ..	U.S.A. ..	O W T
LFG	Spitzbergen ..	Norway	PG Nav	NAK	Annapolis NAK ..	U.S.A. ..	O
			DF	NAL	Washington NAL ..	U.S.A. ..	O
LFR	Röst ..	Norway	PG	NAM	Norfolk Virginia ..	U.S.A. ..	PG
LG.I	Lukuga ..	Belgian	---				Nav
		Congo					W T
LGK	Utsire Radio ..	Norway	PG DF	NAN	Moorhead City ..	U.S.A. ..	PG
			W Nav	NAN	Cape Lookout ..	U.S.A. ..	DF
LGN	Bergen Radio ..	Norway	PG W	NAO	Charleston ..	U.S.A. ..	PG Nav
			DF Nav				W T
LIA	Buenos Aires ² ..	Argentine	---	NAP	S. Augustine ..	U.S.A. ..	PG W
LIB	Trelew ² ..	Argentine	---	NAQ	Jupiter NAQ ..	U.S.A. ..	O W
LIC	Gallegos ² ..	Argentine	---				Nav DF
LIG	Corrientes LIG ² ..	Argentine	---	NAR	Key West NAR ..	U.S.A. ..	PG W T
LIH	Dársena Norte ..	Argentine	PG T				Press DF
LII	Puerto Belgrano ..	Argentine	PG	NAS	Pensacola NAS ..	U.S.A. ..	PG W DF
LIJ	Comodoro Rivadavia	Argentine	PG	NAT	New Orleans NAT	U.S.A. ..	O W T
LIK	Ushuaia ..	Argentine	PG				Nav
LIO	Año Nuevo ..	Argentine	PG	NAU	S. Juan	Porto ..	PG
LIS	Puerto Aguirre ..	Argentine	PG			Rico ..	W Nav
LIT	Eldorado Misiones	Argentine	FX	NAV	Paris Island ..	U.S.A. ..	PG
LIU	Formosa ..	Argentine	PG	NAW	Guantanamo ..	Cuba ..	PG W
LIV	Posados Misiones ..	Argentine	PG				Nav
LIW	La Paz ..	Argentine	PG	NAX	Colon ..	Panama	PG W
LIX	Zarate ..	Argentine	O				T Press
LIY	Martin Garcia ..	Argentine	PG	NAY	Brownsville ..	U.S.A.	PG W T
LIZ	Rio Santiago ..	Argentine	O	NAZ	Managua ..	Nicaragua	O
LJA	San Antonio Lgt.	Argentine	---	NBA	Balboa ..	Panama	PG
LJB	Punta Mogotes ..	Argentine	PG				T Press
LJC	Punta Delgada	Argentine	PG				PG Nav
	Chubut			NBB	S. Thomas ..	Virgin Is.	PG
LJD	S. Julian Sta., Cruz	Argentine	PG	NBD	Bar Harbour ..	U.S.A. ..	Press
LJE	Cabo de las Virgenes	Argentine	PG				

NBG	Indian Head	U.S.A.	O	NSC	Port au Prince	Haiti	PG W
NBL	New London	U.S.A.	O	NSD	Bethany Beach	U.S.A.	DF
NBM	Amagansett	U.S.A.	O DF	NSD	Cape Henlopen	U.S.A.	DF
NBM	Anacostia	U.S.A.	DF	NSD	Cape May NSD	U.S.A.	DF
NBS	Surfside	U.S.A.	DF	NSF	Anacostia NSF	U.S.A.	A
NBX	Port Eads	U.S.A.	DF	NSJ	Washington Labor- atory	U.S.A.	O
NBX	South Pass	U.S.A.	DF	NSR	Nasser	Sudan	O
NCM	Tau	Samoa	O	NSS	Washington NSS Annapolis	U.S.A.	O T Press Nav W
NCZ	Hogg Island	U.S.A.	DF	NUG	Eagle Harbour NUG	U.S.A.	DF
NCZ	Poyner's Hill	U.S.A.	DF	NUW	Soapstone Point	Alaska	DF
NCZ	Virginia Beach	U.S.A.	DF	NVD	Juneau	Alaska	PG
NDD	Washington NDD	U.S.A.	O	NVH	Ketchikan	Alaska	PG
NDW	Cape Hatteras NDW	U.S.A.	PG	NWM	Deer Island DF	U.S.A.	DF
NDY	Dahlgren	U.S.A.	O	NWM	Fourth Cliff DF	U.S.A.	DF
NEL	Lakehurst NEL	U.S.A.	O DF	NWM	Thatchers Island DF	U.S.A.	DF
NEV	Savannah NEV	U.S.A.	PG W	NYR	Nyala	Sudan	O
NEV	Tybee Island	U.S.A.	DF	NZO	Annapolis NZO	U.S.A.	O
NEH	Smith Island	U.S.A.	DF	NZS	Fort Stevens NZS	U.S.A.	DF
NEN	Cattle Point	U.S.A.	DF	NZS	Klipsan Beach	U.S.A.	DF
NFT	New Dungeness	U.S.A.	DF	NZT	Washington	U.S.A.	DF W
NEV	Quantico	U.S.A.	—	NZT	Grand Marias	U.S.A.	DF
NGO	Princes Neck DF	U.S.A.	DF	NZU	Whitefish Point	U.S.A.	DF W
NGX	Oriu	Samoa	O	NZV	Detour Point	U.S.A.	DF
NIDK	N. Atlantic Ice P'tl	U.S.A.	Nav	NZW	Folly Island	U.S.A.	DF
NIG	S. Domingo City	U.S.A.	PG	OAA	North Island	U.S.A.	DF
NJY	Fire Island DF	U.S.A.	DF	OAB	Callao Hablanave	Peru	PG
NJY	Manasquan DF	U.S.A.	DF	OAD	Cachendo	Peru	DF Pr
NJY	Sandy Hook DF	U.S.A.	DF	OAF	Puerto Maldonado	Peru	PG
NAB	Galveston	U.S.A.	PG W Nav	OAG	Fronton	Peru	Rec
NKF	Bellevue	U.S.A.	FX	OAL	Eten	Peru	O
NLD	Bird Island	U.S.A.	DF	OAM	Ilo	Peru	PG
NLG	Point Reyes NLG	U.S.A.	DF	OAN	Masisea	Peru	IG
NLH	Point Montara	U.S.A.	DF	OAP	Magdalena del Mar	Peru	FX
NMD	Point Hueneme	U.S.A.	DF	OAQ	Pisco	Peru	PG
NNI	S. Croix	Virgin Is.	PG Nav	OAS	Leticia	Peru	FX
NNT	Cape Mala	Panama	PG	OAT	Casma	Peru	FX
NNW	La Palma	Panama	PG	OAU	Trujillo	Peru	PG
NPA	Cordova	Alaska	PG	OAY	El Encanto	Peru	FX
NPB	Sitka	Alaska	PG	OAZ	Iquitos	Peru	FX
NPC	Puget Sound	U.S.A.	PG W	OHJ	Lima San-Christobal	Peru	FX
NPE	North Head	U.S.A.	O W T	OJA	Deutsch Altenburg	Austria	W
NPF	Marshfield	U.S.A.	PG	OJB	Helsingfors, Sand- hamn	Finland	FX W
NPF	Empire	U.S.A.	DF	OJC	Wiborg	Finland	Nav
NPG	S. Francisco NPG	U.S.A.	Nav W T Press Cal	OJD	Kotka	Finland	PG
NPH	Hilo	Hawaiian Islands	FX	OJE	Hangö	Finland	Nav*
NPI	Farallon Island	U.S.A.	DF	OJG	Abo	Finland	O
NPJ	Shanghai NPJ	China	Rec	OKB	Waasa	Finland	O
NPJ	Point Arguello	U.S.A.	DF	OKK	Brno (Brünn)	Cz.-Slov.	PG
NPL	S. Diego	U.S.A.	PG W T Press	OKL	Kosice (Karsa)	Cz.-Slov.	FX
NPL	Imperial Beach	U.S.A.	DF	OKM	Liberec	Cz.-Slov.	PR
NPL	Point Loma	U.S.A.	DF	OKP	Moravska Ostrava	Cz.-Slov.	FX
NPM	Honolulu NPM	Hawaiian Islands	O	OKR	Prague	Czecho Slovakia	FX W A Press
NPM	Heela Pt.	Hawaiian Islands	PG	OKV	Brataslava	Cz.-Slov.	FX
NPM	Pearl Harbour NPM	Hawaiian Islands	Nav T W	OKZ	Karlovy Vary	Cz.-Slov.	FX
NPN	Guam	Pacific Is.	PG	ONA	Marianské Lázně	Cz.-Slov.	Rec.
NPO	Cavite	Phil. Is.	PG T W	OPO	Banana	Bel. Congo	PG
NPP	Peking NPP	China	PG	OPVH	Uccle Met. Inst.	Belgium	W
NPQ	S. Paul	Alaska	PG	OFVO	Brussels Haren- Aérodrome	Belgium	A
NPR	Dutch Harbor	Alaska	PG W	OQC	Ostend Aérodrome	Belgium	A
NPS	Kodiak	Alaska	PG	OQD	Coquilhatville	Bel. Congo	—
NPT	Olongapo	Phil. Is.	O	OQH	Kindu	Bel. Congo	—
NPU	Tutuila	Samoa	PG W Nav	OQI	Kingolo	Bel. Congo	—
NPV	Seward	Alaska	PG	OQJ	Elizabéthville	Bel. Congo	—
NPW	Eureka NPW	U.S.A.	PG W T DF	OQK	Umangi	Bel. Congo	—
NPX	Inglewood	U.S.A.	O W	OQL	Kikondje	Bel. Congo	—
NPX	Point Fermin	U.S.A.	DF	OQM	Kinhusa	Bel. Congo	—
NPY	S. George	Alaska	PG	OQN	Lusambo	Bel. Congo	—
NQC	Bar Harbour DF	U.S.A.	DF	OQO	Basoko	Bel. Congo	—
NQG	San Diego	U.S.A.	O	OQS	Stanleyville	Bel. Congo	—
NRK	Puerto Obaldia	Panama	PG	OQV	Basukusu	Bel. Congo	—
NRM	Cape Hinchbrook	Alaska	DF	Oran	Oran Aerodrome	Algeria	A FX
				OSA	Antwerp	Belgium	PG

OST	Ostend	Belgium	PG Nav	PRG	Prague (T)	Czecho-Slov.	B
OIW	Westhinder Lights'p	Belgium	O W	PTC	Fort Santa Cruz	Brazil	O
OUB	Skagens Rev.	Denmark	PR	PTI	Fort Imbuhy	Brazil	O
OUC	Schultz Grund	Denmark	—	PTJ	Fort S. João	Brazil	O
OUE	Gilleleje Flak Lt. V.	Denmark	PR	PTL	Fort Lage	Brazil	O
OUI	V. St. Lt. V.	Germany	FA Press	PTN	Nichterooy	Brazil	O
OJK	Læsø Rende Lt. V.	Denmark	PR	PTQ	Quartel General	Brazil	O
OUR	Amnøit-Rende Lt. V.	Denmark	Nav PR	PTV	Villa Militar	Brazil	O
OUT	Læsø Trindel Lt. V.	Denmark	Nav Ph	Pulham	Pulham (T)	Gt. Brit.	A FX
OUU	Gjedsar, Rev. Lt. V.	Denmark	Bea PR				DF
OUW	Drogden	Denmark	PR	PWA	Habana	Cuba	PG
OUX	Graadyb Lt. V.	Denmark	Bea PR	PWB	Nueva Gerona	Cuba	PG
OUY	Vyl Lt. V.	Denmark	PR	PWC	S. Clara	Cuba	PG
OUZ	Horns Rev Lt. N.	Denmark	PR	PWD	Chaparra	Cuba	PG
OXA	Copenhagen	Denmark	PG W	PWE	Baracoa	Cuba	PG
ONB	Blaavand	Denmark	PG W	PWF	Pinar del Rio	Cuba	PG*
OXC	Gjedsø	Denmark	O	PWG	La Fe	Cuba	PG
OAD	Gjedsø Havn	Denmark	PR	PWY	Camagüey	Cuba	—
OXE	Lyngby	Denmark	FX W	PWZ	Santiago	Cuba	PG
			Pr B				
OXJ	Thorshavn	Faroe Is	Pr. W*	RAA	Astrakhan	Russia	FX
			FX	RAB	Bakou	Russia	FX
OXK	Tverra	Faroe Is	FA	RAC	Viatka	Russia	FX
PA 5	Amsterdam	Holland	B	RAF	Vladikavkaz	Russia	FX
PCA	Amsterdam PCA	Holland	O	RAG	Kiev	Russia	FX W
PCB	Helder PCB	Holland	O	RAH	Kouchka	Russia	FX
PCC	Helder PCC	Holland	Q	RAI	Moscow Oktiabrskaja	Russia	FX W
PCD	Flushing	Holland	O	RAJ	Moscow Mossovet	Russia	FX
PCE	De Mok	Holland	O	RAL	Novo-Nicolaievsk	Russia	FX
PCF	Dutch Aerodromes	Holland	O	RAM	Orenbourg	Russia	FX
PCFF	Amsterdam, Vas	Holland	B	RAN	Obdorsk	Russia	FX W
	Diaz			RAO	Rostowdon	Russia	FX
PCG	Kootwijk-Meyendel	Holland	FX	RAP	Saratov	Russia	FX
PCGG	The Hague	Holland	B	RAQ	Samara	Russia	FX
PCH	Scheveningen Port	Holland	PG W	RAR	Oulianovsk	Russia	FX
PCKK	The Hague (Velt-huyzen)	Holland	B	RAS	Smolensk	Russia	FX
				RAT	Simferopol	Russia	FX
PCM	Terschellingerbank	Holland	Sp	RAU	Taschkent	Russia	FX
	Lightship			RAV	Taganrog	Russia	FX
PCMM	Ijmuiden	Holland	B	RAW	Touapse	Russia	FX
PCN	Noord-Hinder L'ship	Holland	Sp	RAX	Oufa	Russia	FX
PCCU	The Hague (Heussen Lab.)	Holland	B	RAY	Feodosia	Russia	FX
				RAZ	Kharkow	Russia	FX
PJA	Aruba	D. W. Ind.	PG	RBA	Tzaritzyne	Russia	FX
PJB	Bonaire	D. W. Ind.	PG	KBB	Tscheliabinsk	Russia	FX
PJC	Curacao	D. W. Ind.	PG FX	RBC	Seminalatinsk	Russia	FX
PJD	S. Martin	D. W. Ind.	PG	RBW	Ermak	Russia	PG
PJN	Paramaribo	D. W. Ind.	PR	KCC	Iver	Russia	Rec.
PJO	Moengo	D. W. Ind.	P.	RCD	Anadyr	Russia	PG
PKA	Sabang	D. E. Ind.	PG	RCF	Batoum	Russia	O
PKB	Weltevreden	D. E. Ind.	PG	RCG	Fort Ouritskogo	Russia	PG
PKC	Sitoebondo	D. E. Ind.	FX	RCH	Kerbinskaia	Russia	—
PKD	Koepang	D. E. Ind.	PG	RCI	Kertch	Russia	O
PKE	Amboina	D. E. Ind.	PG	RCJ	Kronstadt	Russia	O
PKF	Balikpapan	D. E. Ind.	PG	RCK	Mare-Sale	Russia	PG W
PKG	Tarakan	D. E. Ind.	PG	RCL	Naiakhan	Russia	PG
PKH	Soerabaja	D. E. Ind.	PG	RCP	Petropavlovsk	Russia	PG W
PKI	Bengkalis	D. E. Ind.	FX	RCQ	Petrovsk Daghestan	Russia	PG
PKJ	Nena, Banda	D. E. Ind.	FX	RCQ	Makhatch Kala	Russia	PG
PKK	Manokwari	D. E. Ind.	FX	RCK	Astrakhan	Russia	PG
PKM	Tjilatjap	D. E. Ind.	PG	RCS	Taganrog	Russia	PG
PKN	Semarang	D. E. Ind.	PG	RCT	Sebastopol	Russia	O
PKO	Dobo	D. E. Ind.	FX	RCU	Vaigatch	Russia	PG W
PKP	Medan (Sumatra)	D. E. Ind.	PG	RCV	Vladivostok RCV	Russia	O W
PKQ	Enueh	D. E. Ind.	FX				Nav
PKR	Bima	D. E. Ind.	FX	RCW	Vladivostok RCW	Russia	O
PKU	Waingapoe	D. E. Ind.	FX	RCX	Yougorski-char	Russia	PG W
PKV	Cheribon	D. E. Ind.	PG	RDB	Sviatogor	Russia	PG
PKX	Malabar	D. E. Ind.	FX T	RDE	Odessa	Russia	Control
PKZ	Taroena	D. E. Ind.	PG	RDG	Sredne-Kolymsk	Russia	FX
POZ	Nauen	Germany	FX T	RDH	Odessa Observatory	Russia	FX
			Press	RDI	Petrozavodsk	Russia	FX
PQC	Corvo	Azores	FX	RDJ	Staraia Boukhara	Russia	FX
PQF	Flores	Azores	PG	RDK	Tiflis	Russia	FX
PQH	Faial	Azores	PG	RDM	Rotterdam (T)	Holland	A
PQK	S. Maria	Azores	PG	RDN	Novorossiisk	Russia	PG
PQL	Lisbon	Portugal	PG	RDV	Tchita	Russia	FX
PQM	S. Miguel	Azores	PG	RDW	Moscow Komintern	Russia	FX
PQP	Oporto	Portugal	PG	RDX	Poti	Russia	PG
PQT	Terceira Radio	Azores	PG	RDY	Eriwan	Russia	FX
PQU	Funchal	Madeira	PG	RDZ	Krasnovodsk	Russia	PG

REA	Isakogorka (Archangel)	Russia ..	PG W Nav	STB St. Inglevert	Soesterberg (T) St. Inglevert Aerodrome (T)	Holland France ..	A W A FX W
REB	Morjovets ..	Russia ..	PG	SUC	Abu Zabal ..	Egypt ..	FX W
REC	Kaun Nos ..	Russia ..	PG	SUD	Port Sudan ..	Egypt ..	PG
RED	Iokanga ..	Russia ..	PG Nav	SUH	Alexandria ..	Egypt ..	PG
REE	Mourmansk ..	Russia ..	PG	SUL	Khartoum ..	Sudan ..	O
REF	Isyp Navolok ..	Russia ..	FX	SXA	Athens Nos. 1 and 2	Greece ..	O
REG	Oust-Sysolsk ..	Russia ..	PG	SXB	Athens ..	Greece ..	PG
REK	Feodosia Port ..	Russia ..	FX	SXC	Saionika ..	Greece ..	O
REN	Artemovsk ..	Russia ..	FX	SXD	Alexandroupolis ..	Greece ..	PG
REO	Poltava ..	Russia ..	FX	SXF	Fassa ..	Greece ..	O
RES	Ourda ..	Russia ..	FX W	SXG	Athens Botanique Nos. 1 and 2	Greece ..	W Press O
RET	Podbelsky (Petrograd)	Russia ..	FX	SXI	Isthmus of Corinth	Greece ..	PR
REZ	Ekaterinburg ..	Russia ..	FX	SXX	Corfu No. 1, 2 & 3	Greece ..	O PG
REZ	Sverdlovsk ..	Russia ..	FX	SAL	Salamis ..	Greece ..	O
RFK	Oust Kamchatka ..	Russia ..	FX	SXM	Samos ..	Greece ..	O
RFM	Atbassar ..	Russia ..	FX W	SXN	Canea ..	Crete ..	—
RFN	Kharbarovsk ..	Russia ..	Rec.	SXO	Cinos ..	Greece ..	O
RFO	Soukhom ..	Russia ..	W Nav	SXP	Poros ..	Greece ..	O
RFU	Matochkin Shar ..	Russia ..	W	TFA	Reykjavik ..	Iceland ..	PG
RFV	Dickson ..	Russia ..	W	TFB	Fræney a Breidafirdi	Iceland ..	PG
RFW	Ust Yenesei ..	Russia ..	W	TFC	Vestmannaeyjar	Iceland ..	PG
RFX	Dudinskoe ..	Russia ..	PG	TFD	Kirkjubaejarklauster	Iceland ..	FX
RFY	Novi Port ..	Russia ..	Nav	TFE	Hesteyri ..	Iceland ..	FX
RGE	Timme ..	Russia ..	PG Nav	To I	Tory Island	Ireland ..	FX
RGI	Priemny Lt. V.	Russia ..	A FX	TRW	Lill-Farøer Light- house	Norway	Bea
RGM	Skadovskaia ..	Holland	FX	TSY	Marsten Lighthouse	Norway	Bea
Rotter- dam	Rotterdam	Lithuania	PG W Nav	Tunis UA	Tunis Aerodrome	Tunis ..	A FX
RT	Klaipeda (Memel)				Nantes Basse-Lande	France ..	FX O W Nav*
RYM							
SAA	Karlskrona ..	Sweden	PG Nav	UFP	S. Assise ..	France ..	FX
SAB	Göteborg ..	Sweden	PG Nav	UFQ	S. Assise ..	France ..	FX
SAC	Trälleborg ..	Sweden	PR	UFR	S. Assise ..	France ..	FX
SAD	Flottans Stations	Sweden	O	UFS	S. Assise ..	France ..	FX
SAE	Gottland ..	Sweden	PG	UFI	S. Assise ..	France ..	FX
SAF	Vaxholm ..	Sweden	PG W	UFU	S. Assise ..	France ..	FX
SAG	Olandsrev Lightship	Sweden	Sp.	UNBB	Pancevo ..	Ugoslavia	AW
SAH	Härnösand ..	Sweden	PG Nav	UNA	Herzegrovi ..	Ugoslavia	O
SAI	Boden ..	Sweden	PG Nav	UNS	Sibenik ..	Ugoslavia	O
SAJ	Karlsborg ..	Sweden	FX W Press Nav	US	Swan Island ..	Honduras	P W
SAK	Grundkallen L'ship.	Sweden	Sp	USA	Usumbura ..	Bel. Congo	—
SAL	Vinga ..	Sweden	DF	VAA	Hannax Dockyard	Canada ..	O
SAM	Hallö ..	Sweden	DF	VAB	Point Grey ..	Canada ..	PG W Nav
SDA	Venustiano Carranza	Salvador	—	VAC	Cape Lazo ..	Canada ..	PG W Nav
SFR	Radiola, Paris ..	France ..	B	VAD	Pachena D.F. ..	Canada ..	DF
SNI	Cobras Island ..	Brazil ..	O	VAE	Estevan, B.C. ..	Canada ..	PGW *
SNN	Abrolhos ..	Brazil ..	O	VAF	Alert Bay ..	Canada ..	PG W*
SNQ	Boqueirão Island ..	Brazil ..	O	VAG	Bull Harbour ..	Canada ..	PG W*
SNR	Natal Norte ..	Brazil ..	PG	VAH	Dead Tree Point ..	Canada ..	PG W*
SNU	Ladario ..	Brazil ..	O	VAJ	Digby Island ..	Canada ..	PG W*
SNV	Villegaignon ..	Brazil ..	O	VAK	Gonzales Hill ..	Canada ..	PG W*
SNW	Armacão ..	Brazil ..	O	VAR	S. John, NB ..	Canada ..	DF
SNZ	Raza Island ..	Brazil ..	O	VAS	Louisburg, NS ..	Canada ..	PR
SOD	Anhatomirim ..	Brazil ..	PR	VAT	S. Pauls Island ..	Canada ..	DF
SOH	Governador Island	Brazil ..	O TW	VAU	Yarmouth, N.S. ..	Canada ..	PR DF
SOM	S. Luiz do Maranhão	Brazil ..	PG	VAV	Chebucto Head DF	Canada ..	DF
SOQ	Mocangue Island ..	Brazil ..	O	VAX	Canso DF ..	Canada ..	DF
SPA	Amaralina ..	Brazil ..	PG	VAZ	Cape Race DF	Canada ..	DF
SPB	Belem, Para ..	Brazil ..	FX	VBA	Port Arthur ..	Canada ..	PG W*
SPJ	Junccão ..	Brazil ..	PG	VBB	Sault Ste. Marie ..	Canada ..	Nav PG W*
SPN	Fernando de Noronha	Brazil ..	PG	VBC	Midland, Ont. ..	Canada ..	Nav PG W*
SPO	Olinda Pernambuco	Brazil ..	PG	VBD	Tobermory, Ont. ..	Canada ..	Nav PG W*
SPS	Montserrat ..	Brazil ..	PG	VBE	Point Edward ..	Canada ..	Nav PG W*
SPT	Cape St. Thomé ..	Brazil ..	PG				
SPY	Rio de Janeiro ..	Brazil ..	PG				
SQC	Cruzeiro do Sul ..	Brazil ..	FX				
SOL	Labrea Brasil ..	Brazil ..	FX				
SOM	Manaos ..	Brazil ..	FX				
SQN	Senna Madureira ..	Brazil ..	FX				
SQR	Rio Branco Acre ..	Brazil ..	FX				
SQS	Santarém ..	Brazil ..	FX				
SQT	Tarauaca ..	Brazil ..	FX				
SQV	Porto Velho ..	Brazil ..	FX				
SQX	Xapury ..	Brazil ..	FX				

VBF	Port Burwell ..	Canada	PG W*	VNC	Capetown ..	S. Africa	PG W T
VBG	Toronto ..	Canada	Nav	VND	Durban ..	S. Africa	PG W
VBH	Kingston, Ont. ..	Canada	PG W*	VNF	Dassen Island ..	S. Africa	FX
VBM	Le Pas ¹ , Manitoba	Canada	Nav	VNI	Jacobs Natal ..	S. Africa	O
VBN	Port Nelson ¹ ..	Canada	PG W*	VNJ	Port Nolloth ..	S. Africa	O
VCA	Montreal ..	Canada	Nav	VNN	Table Bay ..	S. Africa	O Nav
VCC	Quebec ..	Canada	O	VNO	East London ..	S. Africa	PG
VCD	Grosse Isle ..	Canada	PG	VNQ	Port Elizabeth ..	S. Africa	PG W
VCE	Cape Race ..	Newf'land	PG W*	VNV	Walvis Bay ..	Brit. S.W. Africa.	PG W
VCF	Father Point ..	Canada	Nav	VOA	Battle Harbour ..	Labrador	FX
VCG	Fame Point ..	Canada	Nav	VOB	Venison Islands ..	Labrador	FX
VCI	Heath Pt. L'ship ..	Canada	PG W*	VOC	American Tickle ..	Labrador	FX
VCK	Clarke City ..	Canada	Nav	VOD	Domino ..	Labrador	FX
VCL	Point Amour ..	Newf'land	NavDF	VOE	Grady ..	Labrador	FX
VCM	Belle Isle ..	Newf'land	PG W*	VOF	Smokey Tickle ..	Labrador	FX
VCN	Grindstone Island	Canada	Nav	VOG	Holton ..	Labrador	FX
VCO	North Sydney ..	Canada	PG W	VOH	Cape Harrison ..	Labrador	FX
VCR	Cape Ray ..	Newf'land	Nav	VOI	Makkovik ..	Labrador	FX
VCS	Camperuown ..	Canada	W Nav	VOJ	Fogo ..	Newf'land	FX
VCT	Sable Island ..	Canada	Bea	VPB	Colombo ..	Ceylon	PG T
VCU	Cape Sable ..	Canada	PG W*	VPC	Falkland Island ..	Falk. Is.	PG
VCZ	Cape Bauld ..	Newf'land	Nav	VPD	(Stanley)		
VDR	Lurcher Lightship	Canada	Nav	VPE	Suva ..	Fiji Is.	PG W
VIA	Adelaide ..	Australia	PG W*	VPF	Lambasa ..	Fiji Is.	PG W*
VIB	Brisbane ..	Australia	Nav	VPG	Taveuni ..	Fiji Is.	PG W*
VIC	Cooktown ..	Australia	Nav	VPJ	Accra ..	Gold Cst.	PG
VID	Darwin ..	Australia	PG W*	VPK	Berbera ..	Br. Somal.	PG
VIE	Esperance ..	Australia	Nav	VPL	Cocos ..	Cocos	PG
VIG	Pt. Moresby ..	N. Guinea	PG W*	VPM	Trinidad ..	Keeling Is.	
VIH	Hobart ..	Australia	Bea	VPN	Tobago ..	Br. W. In.	PG FX
VII	Thursday Is. ..	Australia	PG W*	VPO	Nassau ..	Br. W. In.	PG
VIJ	Samarai ..	N. Guinea	Nav	VPP	Bahamas ..	Bahamas	PG
VIL	Flinders Is. ..	Australia	PG W*	VPQ	Barbados ..	B. W. Ind.	PG
VIM	Melbourne ..	Australia	Nav	VPS	Belize ..	Br. Hond.	PG W
VIN	Geraldton ..	Australia	Bea	VPT	Mombasa ..	Kenya Co	PG
VIO	Broome ..	Australia	W* Nav	VPU	Cape d'Aguilar ..	Hong Kong	PG W
VIP	Perth ..	Australia	Bea	VPW	Malta (St. George's)	Malta ..	DF
VIR	Rockhampton ..	Australia	PG W T	VPX	Sierra Leone ..	S. Leone	PG
VIS	Sydney ..	Australia	Nav	VPY	Singapore ..	Sts. S'mts	PG
VIT	Townsville ..	Australia	PG W*	VPZ	Penang ..	Sts. S'mts	PG
VIU	Kieta ..	Solomon Islands	PG	VQA	Lagos ..	Nigeria.	PG DF
VIV	Madang ..	N Guinea	Nav	VQB	Zanzibar ..	Zanzibar	PG
VIW	Wyndham ..	Australia	PG W*	VQC	Jesselton ..	B.N. B'neo	PG FX
VJZ	Rabaul ..	New Brit.	PG	VQD			
VKT	Nauru ..	Marshall Island	PG	VQE	Sandakan ..	B.N. B'neo	Nav*
VLA	Awanui ..	N. Zealand	PG W*	VQF	Tawao ..	B.N. B'neo	Nav*
VLB	Awarua ..	New Zea.	Nav	VQG	Kudat ..	B.N. B'neo	Nav*
VLC	Chatham Island	New Zea.	PG	VQH	Pemba ..	B.N. B'neo	Nav*
VLD	Auckland ..	New Zea.	PG	VQI	Kuching (T) ..	B.N. B'neo	Nav*
VLG	Ainutaki ..	New Zea.	FX	VQJ	Toco ..	B.N. B'neo	Nav*
VLK	Mangai ..	New Zea.	FX	VQK	S. Lucia ..	B.N. B'neo	Nav*
VLO	Niue ..	New Zea.	FX	VQL	kingston ..	B.N. B'neo	Nav*
VLW	Kawau Island	New Zea.	PG W*	VQM	Tulagi ..	B.N. B'neo	Nav*
VLX	Wellington ..	New Zea.	T	VQN	Ocean Island ..	B.N. B'neo	Nav*
VLZ				VQO	Savu Savu ..	B.N. B'neo	Nav*
VMA	Hector Astronomical Observatory	New Zea.	Control	VQP	Tarawa ..	B.N. B'neo	Nav*
VMB	Apia ..	Samoa Is.	PG W	VQQ	Miri (T) ..	B.N. B'neo	Nav*
VMC	Rarotonga ..	New Zea.	PG	VQR	Kismayu ..	B.N. B'neo	Nav*
VMD				VQS	Sibu (T) ..	B.N. B'neo	Nav*
VME				VQT	Sadong (T) ..	B.N. B'neo	Nav*
VMF				VQU	Burao ..	B.N. B'neo	Nav*
VMG				VQV	Zeyla ..	B.N. B'neo	Nav*
VMH				VQW	Fox Bay ..	B.N. B'neo	Nav*
VMI				VQX	Hargeisa ..	B.N. B'neo	Nav*
VML				VQY	Nukualofa ..	B.N. B'neo	Nav*
VMM				VQZ	Bimini ..	B.N. B'neo	Nav*
VMN				VSA	Goebilt (T) ..	B.N. B'neo	Nav*
VMO				VSJ	Governor's Harbour	B.N. B'neo	Nav*
VMP				VSK	Harbour Island ..	B.N. B'neo	Nav*
VMQ				VSL	Inagua ..	B.N. B'neo	Nav*
VMR				VSM	Bathurst ..	B.N. B'neo	Nav*
				VSN	Grand Turk (T) ..	B.N. B'neo	Nav*
				VSO	Brunei ..	B.N. B'neo	Nav*

VSK	Labuan	Brunei...	FX	WCP	Stevens Point ..	U.S.A. ..	FX
VSL	Temburong ..	Brunei ..	FX	WCQ	Negley T	U.S.A. ..	FX
VSM	Christmas Island..	Christmas Is. (Brit.)	PR	WCV	Wyandotte ..	U.S.A. ..	PR
		Br. N.	P	WCY	Cape May WCY ..	U.S.A. ..	PG
VSN	Silimpopon ..	Borneo		WDS	Hauto (T) ..	U.S.A. ..	FX
VSO	Elbow Cay ..	Bahamas	FX	WDX	Wyoming ..	U.S.A. ..	FX
VSP	Normans Castle ..	Bahamas	FX	WEH	Tulsa (T) ..	U.S.A. ..	FX
VSQ	West End, Grand Bahamas	Bahamas	—	WEQ	Baltimore (T) ..	U.S.A. ..	FX
VSR	Lahad Datu ..	B.N.B'neo	O	WEY	Boston WEY ..	U.S.A. ..	P
VSS	Bintulu ..	Sarawak	—	WFAA	Dallas ..	U.S.A. ..	FX
VST	Mukah ..	Sarawak	—	WFK	Frankfort, Mich. ..	U.S.A. ..	PG
VSU	Selangang ..	Sarawak	FX	WFO	Houston ..	U.S.A. ..	PG
VSV	Simanggang ..	Sarawak	—	WGG	Tuckerton ..	U.S.A. ..	PR
VTC	Basrah ..	Persian G.	PG	WGH	Tuckerton ..	U.S.A. ..	FX
VTE	Bahrein ..	Persian G.	PG	WGL	Philadelphia WGL(T)	U.S.A. ..	FX B
VTF	Bushire ..	Persian G.	PG	WGN	Chicago WGN ..	U.S.A. ..	Nav
				WGO	Chicago WGO ..	U.S.A. ..	PG
VTH	Henjam ..	Persian G.	PG	WGU	Belfast, Me. ..	U.S.A. ..	FX
VTI	Lingah ..	Persian G.	PG	WGW	Vieques ..	Porto Rico	PG
VTO	Mingaladon ..	India ..	FX	WHA	Madison ..	U.S.A. ..	FX
VTP	Port Blair ..	India ..	PG W	WHC	Allentown, Pa. ..	U.S.A. ..	FX
			Nav	WHE	Philadelphia WHE ..	U.S.A. ..	PR
VTR	Rangoon ..	India ..	PG W	WHI	New York WHI ..	U.S.A. ..	PR
			Nav	WHQ	Mackinac Island ..	U.S.A. ..	PG
VTV	Victoria Point ..	India ..	PG	WHT	Rogers (T) ..	U.S.A. ..	PG W
VVO	Poona ..	India ..	FX	WHY	Martinsville T ..	U.S.A. ..	FX
VWA	Allahabad ..	India ..	FX	WHI	New Brunswick WHI	U.S.A. ..	PR
VWB	Bombay ..	India ..	PG W				
			Nav T	WIM	Chatham ..	U.S.A. ..	PG
VWC	Calcutta ..	India ..	PG W T	WIO	Fort Morgan WIO ..	U.S.A. ..	PG
			Nav	WIR	Belfast, Me. ..	U.S.A. ..	FX
VWD	Delhi ..	India ..	FX	WIZ	Benton Harbour ..	U.S.A. ..	PG
VWH	Mhow ..	India ..	FX	WJAV	Eowling Green (T)	U.S.A. ..	FX
VWJ	Jutogh ..	India ..	FX	WJAX	Cleveland ..	U.S.A. ..	W B
VWK	Karachi ..	India ..	PG W	WJB	Lawrenceville (T) ..	U.S.A. ..	FX
			Nav	WJC	Owensboro (T) ..	U.S.A. ..	FX
VWL	Lahore ..	India ..	FX	WJE	Skagit Power Site (T)	U.S.A. ..	FX
VWM	Madras ..	India ..	PG W	WJF	Rochester ..	U.S.A. ..	FX
			Nav	WJJ	Tullahoma ..	U.S.A. ..	FX
VWN	Nagpur ..	India ..	FX	WJL	Greensburg, Pa. ..	U.S.A. ..	FX
VWO	Madras Fort ..	India ..	FX	WJQ	Jackson (T) ..	U.S.A. ..	P
VWP	Peshawar ..	India ..	FX	WJZ	Newark (T) ..	U.S.A. ..	FX B
VWQ	Quetta ..	India ..	FX	WKAP	Cranston (T) ..	U.S.A. ..	P B
VWT	Secunderabad ..	India ..	FX				
VZDB	Naval Staff Office, Melbourne	Australia	O	WKH	Guntersville ..	U.S.A. ..	FX
				WKI	Port Arthur, Tex. ..	U.S.A. ..	PG FX
VZDC	Naval Staff Office, Sydney	Australia	O	WKK	Ceiba ..	Porto Rico	PG PR
VZDF	Naval Staff Office, Brisbane	Australia	O	WLAC	Raleigh (T) ..	U.S.A. ..	P
VZDG	Naval Staff Office, Adelaide	Australia	O	WLB	Minneapolis WLB T	U.S.A. ..	FX B
VZDJ	Naval Staff Office, Perth	Australia	O	WLD	Ludington ..	U.S.A. ..	PG
VZDM	District Naval Office, Hobart	Australia	O	WLF	Wilsonville, Pa. ..	U.S.A. ..	FX
VZE	King Island ..	Australia	PG	WLK	Oberlin ..	U.S.A. ..	FX
VZK	Morobe ..	N. Guinea	PG	WLL	Baltimore WLL ..	U.S.A. ..	P FX
VZO	Manus ..	Adm. Is.	PG	WLP	Minneapolis WLP (T)	U.S.A. ..	FX
VZR	Kaeweing ..	N. Ireland	PG	WMB	Pottsville, Pa. ..	U.S.A. ..	FX
VZX	Aitape ..	N. Guinea	PG	WMW	Manitowoc ..	U.S.A. ..	PG
WAAI	Shock T ..	U.S.A. ..	FX	WNA	Springfield (T) ..	U.S.A. ..	FX
WAH	Eldorado (T) ..	U.S.A. ..	FX	WNN	Mobile ..	U.S.A. ..	PG
WAV	Dearborn, Mich. ..	U.S.A. ..	P	WNO	Alpena, Mich. ..	U.S.A. ..	PR
WAX	Miami Beach ..	U.S.A. ..	PG	WNU	New Orleans WNU ..	U.S.A. ..	PG W
WBAK	Harrisburg T ..	U.S.A. ..	FX	WNY	New York WNY ..	U.S.A. ..	PG
WBAP	Fort Worth ..	U.S.A. ..	FX				
WBF	Boston WBF ..	U.S.A. ..	PG	WOC	Davenport (T) ..	U.S.A. ..	FX B
WBI	Frackville ..	U.S.A. ..	FX	WOD	Beaumont ..	U.S.A. ..	P
WBR	Butler ..	U.S.A. ..	P	WOE	Palm Beach, Fla. ..	U.S.A. ..	PG
WBU	Chicago WBU (T)	U.S.A. ..	P	WOH	Manistique ..	U.S.A. ..	PG
WBW	Burwood ..	U.S.A. ..	PG	WPA	Port Arthur ..	U.S.A. ..	PG
				WPAH	Waupaca ..	U.S.A. ..	FX
WBY	Lima T ..	U.S.A. ..	FX	WPD	Tampa ..	U.S.A. ..	PG
WBZ	Springfield (T) ..	U.S.A. ..	FX B	WPF	Flagship Division I, Camp Eustis (T)	U.S.A. ..	PR
WCC	Marion WCC ..	U.S.A. ..	PG	WPH	Williamsport ..	U.S.A. ..	FX
WCG	New York WCG ..	U.S.A. ..	PG	WPI	Memphis, Tenn. ..	U.S.A. ..	P
WCI	Barneget ..	U.S.A. ..	FX	WPL	St. Croix Falls T ..	U.S.A. ..	FX
WCJ	Hazelton (T) ..	U.S.A. ..	FX	WPM	Birmingham ..	U.S.A. ..	P
				WPP	Mobile WPP ..	U.S.A. ..	P
				WPR	Ensenada ..	Porto Rico	PG
				WQK	S. James, N.Y. ..	U.S.A. ..	PR

WQL	Coram Hill ..	U.S.A. ..	FX	WVV	Jefferson Barracks	U.S.A. ..	O
WQM	Rocky Point, N.Y.	U.S.A. ..	FX	WVW	Fort D. A. Russell	U.S.A. ..	O
WRM	Urbana (T) ..	U.S.A. ..	FX B	WVX	Fort Douglas, Utah	U.S.A. ..	O
WRQ	Marion WRQ ..	U.S.A. ..	FX	WVY	S. Francisco WVY	U.S.A. ..	O
WRT	New Brunswick	U.S.A. ..	FX	WVZ	Fort Hayes O. ..	U.S.A. ..	O
	WRT			WWAF	Boston Lt.V. ..	U.S.A. ..	Bea
WSA	East Hampton, N.Y.	U.S.A. ..	PG	WWAG	Pollock Kip Slue Lt.	U.S.A. ..	PG*
WSC	Tuckerton WSC ..	U.S.A. ..	PG		V.		
WSE	New York WSE ..	U.S.A. ..	PG	WWAH	Nantucket Shoals	U.S.A. ..	PG*
WSH	East Moriches ..	U.S.A. ..	PG		Lt. V.		Bea
WSK	Sheboygen, Wis. ..	U.S.A. ..	PG	WWAI	Relief Lt. V. No. 85	U.S.A. ..	O
WSO	Marion WSO ..	U.S.A. ..	PR	WWAJ	Relief Lt. V. No. 90	U.S.A. ..	O
WST	New London, Conn.	U.S.A. ..	PG	WWAL	Superior Entry Lt.	U.S.A. ..	O
WTK	Cleveland ..	U.S.A. ..	PG W		Stn.		
WUA	Fort Andrews ..	U.S.A. ..	O	WWAM	Cornfield Point Lt. V	U.S.A. ..	PG*
WUAC	Fort Crockett, Tex.	U.S.A. ..	FX	WWAN	Fire Island Lt. V.	U.S.A. ..	PG*
WUAD	Fort Frank ..	Phil. Is.	O				Bea
WUAE	Fort Storey, Va. ..	U.S.A. ..	O	WWAQ	North East End	U.S.A. ..	PG*
WUAF	Fort Washington,	U.S.A. ..	FX		Lt. V.		
	Md.			WWAR	Five Fathom Bank	U.S.A. ..	PG*
WUAG	Fort Mills WUAG	Phil. Is.	FX		Lt. V.		
WUAH	West Point, N.Y...	U.S.A. ..	O	WWAS	Relief Lt. V. No. 78	U.S.A. ..	O
WUAI	Fort Ethan Allen...	U.S.A. ..	FX	WWAT	Ambrose Chan. Lt. V	U.S.A. ..	PG*
WUAJ	Manila ..	Phil. Is.	O				Bea
WUAK	Fort Wint ..	Phil. Is.	O	WWAW	Fenwick Is. Shoal	U.S.A. ..	FG*
WUAL	Fort Drum ..	Phil. Is.	O		Lt. V.		
WUAV	Fort Levett, Me. ..	U.S.A. ..	FX	WWAX	Winter Quarter	U.S.A. ..	PG*
WUB	Fort Hancock, N.Y.	U.S.A. ..	O		Shoals, Lt.V. ..		
WUBA	Camp Alfred Vail..	U.S.A. ..	FX	WWAY	Cape Charles Lt. V.	U.S.A. ..	PG*
WUBB	Metuchen, N.J. ..	U.S.A. ..	FX	WWAZ	Diamond Shoals Lt.	U.S.A. ..	PG*
WUBC	Camp Knox, Ky. ..	U.S.A. ..	FX		V.		Bea
WUBD	Fort Sill, Okla. ..	U.S.A. ..	O	WWBA	Cape Lookout Shoals	U.S.A. ..	PG*
WUBE	Fort Grant ..	Panama	FX		Lt. V.		
WUBR	Fort Travis, Tex.	U.S.A. ..	FX	WWBB	Relief Lt. V. No. 72	U.S.A. ..	O
WUBV	Key West WUBV	U.S.A. ..	FX	WWBE	Fryingpan Shoals	U.S.A. ..	PG*
WUBY	Fort Tilden, N.Y.	U.S.A. ..	FX		Lt. V.		
WUC	Fort H. G. Wright	U.S.A. ..	O	WWBG	Brunswick Lt. V.	U.S.A. ..	PG*
WUCA	Camp Stotsenburg	Phil. Is.	O	WWBH	Relief Lt. V. No. 109	U.S.A. ..	O
WUCB	Fort John Hay ..	Phil. Is.	O	WWBJ	Heald Bank Lt. V.	U.S.A. ..	PG*
WUCG	Fort De Lesseps ..	Panama	O	WWBO	Swiftsure Bank Lt.	U.S.A. ..	PG*
WUCH	Fort Sherman ..	Panama	O		V.		Bea
WUCI	Fort Randolph ..	Panama	O	WWBP	Umtilla Reef Lt. V.	U.S.A. ..	PG*
WUCK	Fort McArthur, Tex.	U.S.A. ..	O	WWBQ	Columbia River Lt.	U.S.A. ..	PG*
WUCN	Fort Rodman, Mass.	U.S.A. ..	FX		V.		Bea
WUCU	Fort Williams, Me.	U.S.A. ..	O	WWBR	Relief Lt. V. No. 92	U.S.A. ..	O
WUD	Fort Porter ..	U.S.A. ..	FX	WWBU	Blunts Reef Lt. V.	U.S.A. ..	PG*
WUE	Fort Niagara ..	U.S.A. ..	FX				Bea W
WUF	Fort Monroe, Va.	U.S.A. ..	O	WWBV	San Francisco Lt. V.	U.S.A. ..	PG*
WUG	Camp Marfa, Tex.	U.S.A. ..	FX				Bea W
WUH	Fort McIntosh, Tex.	U.S.A. ..	O	WWEA	Navassa Island ..	W'd. Pas.	O
WUI	Fort Riley, Kans.	U.S.A. ..	FX	WWEB	Duluth Range Rear	U.S.A. ..	O
WUJ	Juneau ..	Alaska	—		Light Stn.		
WUK	Fort Stevens WUK	U.S.A. ..	O	WWEJ	Marquette Light Stn	U.S.A. ..	O
				WWEF	Cape Sarichef (T) ..	Alaska ..	O
WUL	Fort Totten, N.Y.	U.S.A. ..	O	WWEH	Scotch Cap (T) ..	Alaska ..	O
WUM	Circle ..	Alaska ..	FX	WWEI	Cape Spencer (T) ..	Alaska ..	O
WUN	Fort Worden, Wash.	U.S.A. ..	O		St. George Reef,	U.S.A. ..	O
WUO	Fort Winfield Scott	U.S.A. ..	O		Cal.		
WUP	Fort Mills ..	Phil. Is.	O	WWEJ	Crescent City, Cal.	U.S.A. ..	O
WUQ	Tientsin ..	China ..	O	WWBW	Relief Lt. V. No. 76	U.S.A. ..	O
WUR	Fort Morgan WUR	U.S.A. ..	O	WWJ	Detroit WWJ ..	U.S.A. ..	FX B
				WWO	Cleveland WWO	U.S.A. ..	O
WUS	Fort Rosecrans ..	U.S.A. ..	FX	WWP	Savoonga ..	Alaska ..	FX
WUT	Ketchikan ..	Alaska ..	—	WWQ	Bellefont ..	U.S.A. ..	A
WUV	Livengood ..	Alaska ..	FX	WWR	Wau ..	Sudan ..	O
WUW	Fort Terry, N.Y. ..	U.S.A. ..	O	WWS	Sch nectady ..	U.S.A. ..	FX
WUX	Bethel ..	Alaska ..	PG	WWT	Afognak ..	Alaska ..	FX
WUY	Holy Cross ..	Alaska ..	FX	WWU	Hempstead ..	U.S.A. ..	O
WUZ	Fort Brown, Tex.	U.S.A. ..	O	WWV	Washington WWV	U.S.A. ..	O
				WWX	Washington WWX	U.S.A. ..	O
WVA	Washington ..	U.S.A. ..	—	WWY	Pittsburgh ..	U.S.A. ..	FX
WVB	Fort Sam Houston	U.S.A. ..	O	WXG	Wiseman ..	Alaska ..	FX
WVC	Fort Leavenworth	U.S.A. ..	FX	WNJ	Vardez ..	Alaska ..	FX
				WXX	Hot Springs ..	Alaska ..	FX
WVO	Boston WVO ..	U.S.A. ..	O	WXL	Iditaroc ..	Alaska ..	FX
WVP	Governors Island ..	U.S.A. ..	O	WXN	Fortuna ..	Alaska ..	FX
WVQ	Fort Howard, Md. ..	U.S.A. ..	O	WXP	Craig ..	Alaska ..	PG
WVR	Fort McPherson Ga.	U.S.A. ..	O	WXP	Fairbanks ..	Alaska ..	FX
WVS	Fort Benj. Harrison	U.S.A. ..	O	WXQ	Fort Egbert ..	Alaska ..	FX
WVT	Chicago WVT ..	U.S.A. ..	O	WXS	Fort Gibbon ..	Alaska ..	FX
WVU	Fort Omaha, Nebr.	U.S.A. ..	O	WXT	St. Michael ..	Alaska ..	PG

WXU	Ruby WXU ..	Alaska ..	FX	WZP	Fort Huachuca, Ariz.	U.S.A. ..	O
WXV	Tacotna ..	Alaska ..	O	WZS	Fort Snelling, Minn.	U.S.A. ..	O
WXW	Kotzebue ..	Alaska ..	—	WZT	Fort Des Moines	U.S.A. ..	FX
WXX	Fort Yukon ..	Alaska ..	FX	X	Port Limon ..	Costa Rica	P
WXY	Nome ..	Alaska ..	PG				
WXZ	Nulato ..	Alaska ..	FX	XA	Kamahusa ..	B. Guiana	—
WYA	Mitchell Field, N.Y.	U.S.A. ..	O	XAA	Veracruz de Veracruz	Mexico ..	PG
WYB	Bolling Field, D.C.	U.S.A. ..	O				
WYC	Langley Field, Va.	U.S.A. ..	O	XAB	Campeche ..	Mexico ..	PG
WYCJ	West Memphis ..	U.S.A. ..	O	XAC	Payo Obispo ..	Mexico ..	PG
WYD	Fairfield O ..	U.S.A. ..	O	XAD	Alamos de Sonora	Mexico ..	PG
WYE	Selbridge Field, Mich.	U.S.A. ..	O	XAE	Mazatlan de Sinoloa	Mexico ..	PG W
WYF	Scott Field, Ill. ..	U.S.A. ..	O	XAF	La Paz de la Baja	Mexico ..	PG
WYG	Kelly Field, Tex.	U.S.A. ..	O				
WYH	Rockwell Field, Calif.	U.S.A. ..	O	XAG	S. Rosalia de la Baja	Mexico ..	PG
WYI	Langin Field, W.Va.	U.S.A. ..	O	XAH	Hermosillo ..	Mexico ..	PG
				XAI	Tuxpan de Veracruz	Mexico ..	PG
WYJ	Chanute Field, Ill.	U.S.A. ..	O	XAJ	Tampico de Tamaulipas	Mexico ..	PG
WYK	Maxwell, Ala. ..	U.S.A. ..	O				
WYP	France Field ..	Panama	O	XAK	Acapulco de Guerrero	Mexico ..	PG
WYQ	Luke Field ..	Hawaiian Islands	O	XAL	Puerto Lobos ..	Mexico ..	PG
WYR	Kindley Field ..	Philippine Islands	O	XAM	Merida de Yucatan	Mexico ..	PG
WYS	Clark Field ..	Philippine Islands	O	XAN	Salina Cruz ..	Mexico	PG
WYT	Camp Nichols ..	Phil. Is.	O	XAO	Maria Madre Isld.	Mexico	PG
				XDA	Chapultepec ..	Mexico	W
WZA	Fort Screven, Ga.	U.S.A. ..	O	XNP	Canton ..	China ..	PG
WZB	Fort Clark, Tex. ..	U.S.A. ..	O	XOC	Wuchang ..	China ..	PG
WZC	Fort Whitman, Wash.	U.S.A. ..	O	XOF	Chetoo ..	China ..	PG
WZD	Fort Barancas, Fla.	U.S.A. ..	O	XOW	Foochow ..	China ..	PG
WZE	Fort Constitution, N.H.	U.S.A. ..	FX	XPK	Peking XPK	China ..	PG
WZF	Fort Moultrie, S.C.	U.S.A. ..	FX	XQL	Kalgan ..	China	FX
WZG	Fort Bragg, N.C. ..	U.S.A. ..	O	XRI	Tsingtau ..	China ..	PG
WZI	Fort Ringgold, Tex.	U.S.A. ..	FX	XSG	Woosung ..	China ..	PG
WZJ	Fort Casey, Wash.	U.S.A. ..	O	XSH	Shanghai XSH	China ..	PG
WZL	Camp S. D. Little	U.S.A. ..	FX	XSU	Ts nemine ..	China ..	FX
WZM	Camp Harry J. Jones	U.S.A. ..	FX	XYZ	Peking XYZ	China ..	O
WZO	Fort Bliss, Tex. ..	U.S.A. ..	O	YG	S. Pierre des Corps	France	FX
				YN	Lyön la Doua ..	France	FX TB
							Cal. Pr

THE PROGRESS OF RADIO DIRECTION-FINDING DURING 1924 AS AN AID TO NAVIGATION.

By R. L. SMITH-ROSE, Ph.D., M.Sc., D.I.C., A.M.I.E.E.

IN connection with the application of the radio direction-finder (D.F.) to navigation considerable discussion has always taken place on the question as to whether the D.F. should be located on the ship or aircraft to be navigated or on the shore. In the last edition of this YEAR Book the writer considered this question together with that of the choice of system at some length, and showed that although land stations had generally been used in the past there appeared to be a tendency to install them on shipboard. This conclusion has been shown to be justified by the recent progress of direction-finding, for while the regrettably small number of D.F. stations in the world has been increased to only a very small extent, the number of ships being fitted is increasing rapidly, particularly in the British Mercantile Marine. It is probably the inevitable line of progress that a new instrument to be used for navigation purposes should ultimately find its way into the hands of the man who is responsible for navigating his ship. Indeed the very name allotted to the instrument in the United States, viz.: the Radio Compass, suggests that its use on shipboard has been appreciated from the outset.

In spite of this strong tendency, however, it must be borne in mind that there is probably still justification for the establishment of an efficient system of shore D.F. stations around parts of the coasts of all countries which present difficulties to navigation in foggy or stormy weather. Many ships, while being fitted with wireless sets for ordinary communication, or even only emergency purposes, may not carry the necessary skilled personnel or may not need to use the D.F. sufficiently frequently to justify the installation of an instrument on board; yet there may be occasions when facilities for obtaining a bearing or preferably, a position fix from the shore would be of considerable assistance.

THE USE OF THE D.F. ON BOARD SHIP.

As previously emphasised the chief drawback inherent in the use of the D.F. on the ship itself is the existence of the quadrantal error in the observed bearings due to the hull, funnels, stays and other metal parts of the ship. In an account of the development of the Bellini-Tosi D.F. system in the British Mercantile Marine, J. A. Slee¹ discusses this question and states that the error can be completely removed by reducing the area of the fore-and-aft loop relative to that of the thwartships loop, or by varying the impedance of the loop circuits or by a combination of these methods. In the same paper other errors which are inherent in the installation of a D.F. on shipboard are discussed in some detail together with the means adopted for their elimination. To ensure accurate working of the set the main wireless aerial must always be disconnected when taking bearings, and care must be taken that no wires or even wet rope halyards pass in proximity to either of the aerial loops since a movement of these would cause a variable error due to lack of symmetry of the loops. The final calibration and adjustment of such a direction-finder on board ship must be carried out at sea since the presence of cranes and other metalwork in docks will give rise to unknown errors.

While a few British ships are fitted with frame coil sets of the Robinson type, it is on the French ships and more particularly those of the United States that the single frame coil D.F. finds application. In the latter country

the instrument is generally recognised as a direct aid to navigation when used on shipboard ; and the provision of suitable beacon transmitting stations for the use of the ship D.F. sets is understood to be the duty of the same Government Department that provides the lighthouse and fog-signal services around its coast. An excellent idea of the development and the present position of the Radio-Compass in the United States may be gathered from a booklet recently issued by the Lighthouse Service of the Department of Commerce². From the attitude adopted towards the instrument, it is natural to find that the usual location of the apparatus is not in or near the wireless office but in the pilot house. The rotating coil is mounted on the deck above, with the supporting spindle passing down into the house below, where a hand wheel is provided for rotating the coil. It is convenient to mount the arrangement directly over the compass binnacle so that the D.F. coil pointer moves over the compass and the observed bearings are therefore read not in reference to the direction of the ship's head but to that of magnetic north. Adjustable scales are provided round the periphery which give the necessary corrections to be made for the compass, the magnetic deviation and the quadrantal D.F. error due to the ship. By this means one observation of the position of the pointer or cross-wires enables the true wireless bearing to be read off without reference to any curves or tables. Long experience with one ship D.F. in America which has been calibrated at frequent intervals has shown that the quadrantal error of the ship has remained unaltered for about three years. It is however the experience of some workers in this art that the quadrantal error is liable to change with an alteration in draught of the ship³. The receiving apparatus is reduced to the simplest form so that a navigator comparatively unskilled in wireless matters may operate the set. A necessary refinement in the matter is the direct connection between the D.F. set and the wireless room, such that when the headphones of the former are removed from their supporting hook a signal lamp is operated in the wireless cabin for the information of the operator on duty. Unless he is actually engaged in transmitting or receiving any traffic this operator disconnects the main aerial circuit, which automatically switches in a return signal lamp in the pilot house informing the navigator that the D.F. may be used.

In probably the majority of cases the user of the D.F. set on a ship knows the general direction of the transmitting station whose bearing is being observed, so that the bilateral characteristic of the ordinary apparatus giving an uncertainty of 180 degs. in the actual bearing is not important. In some types of both the British and American D.F. sets a slight addition is made in the way of a "Sense-finding attachment" to remove this uncertainty. By a modification of the circuit arrangement the antenna effect of the receiving loop or loops is made use of to give the apparatus a directional receiving characteristic with only a single minimum. Without elaborate adjustment this minimum is not usually sharp enough for accurate D.F. work, but having determined the "sense" of the bearing, its actual value is subsequently read off accurately after switching to the pure D.F. circuit arrangement.

With the multi-turn frame coil direction-finder the vertical height of the coil is frequently too small to give sufficient "antenna" E.M.F. to obtain satisfactory sense-minima. Experiments carried out with the view of overcoming the difficulty have been described by E. Bellini⁴. The midpoint of the frame coil is connected to earth through a variable resistance, and the detecting amplifier is connected across only one-half of the coil.

Single frame coil direction-finders developed on this principle are being manufactured and fitted to French ships by the Société Française Radio-électrique. The instrument appears to be quite satisfactory and to possess adequate receiving range for all ordinary navigation purposes, and it is estimated that a hundred instruments will be in operation at the end of the year.

FIXED BEACON TRANSMITTERS.

Concurrently with the development of the radio-compass on board ship the United States authorities have proceeded with the establishment of radio beacons, or fixed wireless transmitting stations which send certain code signals automatically when once set in operation. About eleven of these stations are already in operation, and some 47 others are proposed or in course of erection². The majority are located on light vessels or near shore lighthouses in the vicinity of the chief harbour entrances, but a few of the future stations will be situated on the Great Lakes in the North of the United States. Each station has a characteristic signal easily recognisable by an untrained ear and distinctive from any other in the vicinity, and all the stations are clearly marked on charts at points well known to navigators, so that a radio bearing can be definitely identified and plotted on the chart with the same facility as a sight bearing on a light.

Reference to the published information available shows the interesting fact that while the number of British ships fitted with D.F. is more than twice as great as that of any other country, the United States and Italy being next in order, there is as yet only one fixed wireless beacon in the British Isles officially working for the use of these ships. Of course, the majority of the ships fitted are able to take bearings upon any of the numerous coast transmitting stations in its vicinity, but it is probable that in the near future fixed radio beacons will be almost as common as lightships and lighthouses along our shores.

THE ACCURACY OF DIRECTION-FINDING FOR NAVIGATION.

It is gratifying to note that with the continued use and development of D.F. those responsible are making known their results and experiences through publications of various kinds. Only by such "advertisement" and free discussion of the results obtained can the necessary confidence be engendered in the minds of those, such as shipowners and navigators, whose sole interest in the instrument is as an aid to navigation in treacherous times and places. Experience with the ship direction-finders in use in the British Mercantile Marine¹ shows that at ranges up to about 70 miles across the open sea over 90 per cent. of the bearings observed by the ordinary operator are accurate to within 2 degs., a value which appears to be quite adequate for most navigation purposes, particularly when a position fix is possible from several stations. In cases where land intervenes in the path of transmission, or the waves travel parallel with the coast line, appreciable and often variable errors are encountered which considerably reduce the above accuracy. As the result of careful observation, however, suitable warning as to the possibility of such errors can be given on the appropriate navigation charts. In some specimen charts already prepared⁵ for example, the convenient arrangement is used of marking out "arcs of good bearings" from all the fixed beacons and the coast wireless stations likely to be used for D.F. purposes. The recorded experience of the United States service² gives the same value of 2 degs. as the accuracy of the majority of bearings taken by a ship direction-finder, and in the publication referred to many concrete examples are given of the value of such bearings to ships in distress or difficulties; or in enabling the ship to avoid considerable delay due to the prevalence of fog lasting at times for several days and making ordinary navigation by sights impossible.

The above experience has been confirmed and the limiting conditions to which the results are applicable have been clearly brought out in a series of systematic experiments organised by the Radio Research Board and carried out under the author's supervision.⁶ These experiments were

carried out between two D.F. stations, one on the coast and one about 100 miles inland, and various steamships in their normal passage across the North Sea. Careful attention was paid to every possible extraneous error, in order to study the performance of the shore D.F. in its normal application to the taking of bearings on ship transmitters. Under practical working conditions at various times of the day and night the results showed that when the path of transmission does not exceed about 80-100 miles across the open sea and is well clear of the coast line, over 95 per cent. of the bearings are correct to within 2 degs., the limiting error being about 4 degs. For distances greater than 100 miles the accuracy diminishes rapidly with increase of distance owing to the commencement of the well-known night errors. When the path of transmission is entirely overland the limiting distance for the absence of night errors is about 30 miles, and at greater distances the accuracy of D.F. is maintained during the hours of daylight only.

Since the chief use of D.F. for marine navigation is at ranges seldom greater than 70 miles and usually across the open sea, the above experiences of several independent workers may be considered as conclusive on the adequate reliability of D.F. for present requirements. It appears also to be the unanimous opinion of those who have taken these systematic observations that the existence of fog, when of course D.F. is chiefly required, in no way diminishes the accuracy of wireless bearings.

In connection with aerial navigation the distance is likely to greatly exceed the above limit and the path of transmission will be over both land and sea. In view of the very limited amount of data available at the present time, it is difficult to draw any conclusions as to the limiting conditions for the maintenance of accuracy. While the use of the D.F. on the aircraft has been tried in at least the experimental stage, the existing commercial aircraft appear to rely upon bearings and position given them by ground D.F. stations.

DAMPED VERSUS UNDAMPED WAVES.

Owing to the fact that the vast majority of ships carrying installations are fitted with the crystal type of receiver it is natural to find that all the existing D.F. stations are working on "spark" or damped wave transmissions. With the rapid increase in the number of ship D.F. installations and the consequent need for the provision of suitable fixed beacon stations giving almost continuous and automatic transmissions the desirability of changing over to continuous or at least modulated continuous waves, becomes evident. The use of continuous waves in the early days of the modern direction-finder and under war conditions appears to have given rise to an impression that these are more subject to night errors than damped waves and that even skilled operators are unable to distinguish between good and bad bearings. In a paper already mentioned¹, especially in the discussion thereon, some very conflicting evidence based upon more recent experience was brought to light. Pending the results of more systematic experiments particularly directed to this point, the matter must remain somewhat open. Some experiments have already been carried out, however, by the United States authorities⁷ with beacons provided with modulated continuous wave transmitters, and comparative tests with these and the spark transmitters showed that at various distances up to 132 miles the accuracies obtained were practically identical in each case, both by day and night. The faith of the authorities in their results is exemplified by the fact that they are already introducing the modulated continuous wave transmitters into their beacon stations.

Limitations of space at present prohibit the discussion on theoretical grounds of this and other problems connected with directional wireless ;

but some delay will probably be advantageous since much more quantitative experimental evidence is required to enable the discussion of existing theories to be carried out in any detail.

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LAWS, REGULATIONS AND PROCEDURE RELATING TO DIRECTION FINDING*

WIRELESS DIRECTION FINDING STATIONS.

INTRODUCTION.

WIRELESS direction finding (D.F.) stations are W/T stations established on shore equipped with apparatus which enables them to ascertain the direction from which wireless signals transmitted by another station emanate.

The procedure to be adopted, which varies to some extent for the different stations and as to the wavelength to be used, is set out in the following pages in detail. It is equally necessary that W/T operators should study the procedure.

Briefly put, a ship requiring a bearing calls upon the D.F. station or stations from which it is desired to receive a bearing, singly or together, according to the procedure laid down. The station or stations reply directing the ship to transmit her call signal for one minute, on the conclusion of which the station, or stations, will signal the bearings (true) of the ship from that station.

The accuracy with which bearings can be taken depends on the conditions outlined below; but, although in general the bearings taken by a station within the sector over which it is designed to work can generally be considered accurate to within 002 degs., the Administrations controlling these stations cannot accept any responsibility for the consequences of a bearing being inaccurate.

It is, however, pointed out that if at least three D.F. stations can be employed and if they are so situated as to give intersecting bearings, considerable reliance can be placed upon the result of three simultaneous bearings thus obtained, provided that the "triangle of error" (sometimes called the "cocked hat") formed by the intersection of the bearings is small.

In order to obtain the best results, it is important that the ship should not transmit with too much power. Signals should, however, be fairly strong and clear; great care must be taken to keep the note and strength steady and to pay strict attention to spacing; and the instructions should be rigidly adhered to. Accuracy of bearings will probably be affected if the ship's transmitting instrument is not adjusted to the *correct* wavelength.

It must be borne in mind that it is impossible for the majority of existing D.F. stations to distinguish between a bearing and its reciprocal (*i.e.*, there is always a possible error of 180 degs.), and that bearings are often unreliable at night and in stormy weather, also when the direction runs roughly parallel with the coast line, or passes alternately over water and land.

The methods of asking for and giving bearings and the waves to be used will in future probably be standardised by International agreement. Meanwhile, each country is publishing regulations governing the use of its own D.F. stations.

There are three systems of D.F. stations at present operating, viz. :—

- (a) Where each D.F. station is fitted with transmitting and receiving gear and works independently.
- (b) Where several D.F. stations (all of them usually near a harbour entrance or difficult passage) are linked together by special telegraph

* Obtained chiefly from "The Admiralty List of Wireless Signals," the "Radio Service Bulletin" of the Department of Commerce, U.S.A., and the Secretary's Office of the General Post Office, for which due acknowledgment is hereby made.

cables, being thus controlled by one station which alone is fitted with transmitting apparatus. The controlling station in such cases is not necessarily a D.F. station, but may be an ordinary coast station.

- (c) Where a ship requires a single bearing only. In this case the vessel calls the W/T station belonging to the D.F. station. The bearing, however, is calculated from the D.F. station.

Coast Refraction or ("Land Effect").—In the case of bearings which cut the coastline at an oblique angle, errors of from 4 degs. to 5 degs. have been reported.

Sunrise, Sunset or Night Effects.—Bearings obtained between about half an hour before sunset and half an hour after sunrise are generally unreliable on account of the excessive error introduced. These errors are not so great when only an expanse of sea separates the two stations; but in the case of the bearing passing over land, particularly if it is hilly country, the amount of error is abnormal. Changes in the intensity of the signal received also occur at sunset and sunrise, and apart from the above-mentioned variations, changes in the signal strength of the transmitting station have also been observed at these times.

Caution.—Bearings signalled as "Approximate" or "Second Class," must be treated with grave suspicion, as very considerable errors may exist in such bearings.

Gnomonic Charts.—On a chart constructed on the gnomonic projection D.F. bearings can be laid down without correction, due to the fact that on this projection great circles appear as straight lines. There is, however, an angular alteration in this projection which makes it necessary, in order to plot D.F. bearings, to have a compass rose for each D.F. station so constructed as to compensate for the angular alteration of the projection at that station.

D.F. INSTALLATIONS ON BOARD SHIPS.

A ship's wireless direction finder, if properly constructed, installed and calibrated, is an effective aid to navigation for obtaining bearings of W/T stations whose exact geographical positions are known.

The instrument should be installed approximately amidships on the centre line of the vessel, so that the mass of the ship is symmetrically arranged with respect to it.

Calibration is necessary, and this is done by taking simultaneous visual and D.F. bearings of a shore station. The errors are tabulated or a correction curve made. If the 360 deg. system is employed, it will be found that the correction changes from additive to subtractive in successive quadrants. Under normal conditions the errors are fairly constant, minimum deviation occurring when the observations are taken right ahead, right astern, or on either beam, maximum deviation occurring when the direction of approach of the signalling wave is 45 degs. from the fore and aft line, that is, when the mass of the ship assumes an unsymmetrical relation with respect to the approaching wave front.

In order to minimise the danger of undue reliance being placed on incorrect bearings obtained by D.F. installations, it should be borne in mind that errors are also liable to occur due to :—

- (i) Aerial wires in the ship other than those fitted for D.F.
- (ii) Atmospheric effects (including what is termed sunrise, sunset, or night effects). Coast refraction (often referred to as "Land Effect").
- (iii) Pointer slipping.
- (iv) Errors in gyro repeaters or compass of comparison.
- (v) Alterations to stays, derricks, or other fixtures in vicinity of D.F. office after installation has once been calibrated.

Of these, (i) and (ii) nearly always result in blurred zeros. This should be generally realised, as it affords a valuable means of recognising doubtful bearings.

Reliance can only be placed on D.F. bearings when the following conditions have been fulfilled:—

- (a) The "zero" is perfect (*i.e.*, no matter how high the amplification, a position of the search coil can be found in which there is complete silence).
- (b) The transmitting station is not more than 50 miles distant.
- (c) One aerial zero is checked immediately after the bearing or series of bearings.
- (d) The gyro repeater has been checked at some time during the watch, so that any error of the compass of comparison is known and allowed for.

To obtain good accuracy in fixing position by D.F. cross bearings, bearings from not less than three different stations should be obtained, one station being situated on the nearest coast.

Special attention is drawn to (a) above. If, for any reason, this condition is not satisfied, the bearings should not be considered reliable.

In the "Land Station" section of this publication will be found the geographical position of all shore W/T stations, and this information may be made use of by ships desirous of using their own D.F. installations.

When employing this method of obtaining a bearing, the shore station must be called in the orthodox manner, as the regulations governing the use of D.F. stations do not apply. To facilitate a ship taking a bearing with her own D.F. gear, the following signals have been provisionally adopted for W/T stations in Great Britain:—

QTG = Please transmit your station's call sign for one minute, in order that a D.F. bearing may be obtained.

QTG ? = Shall I transmit call sign of this station for one minute, in order that a D.F. bearing may be obtained ?

The ship concerned will be debited with a charge of 5s. in respect of each call.

FIXING POSITION BY WIRELESS DIRECTIONAL BEARINGS.

(N.B.—The W/T stations referred to in this article do not necessarily exist.)

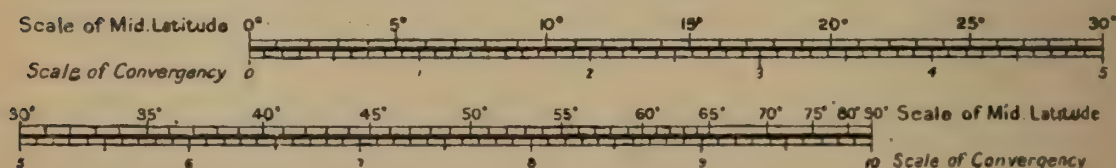
I.—GENERAL.

Fixing position by directional wireless is very similar to fixing by cross bearings from visible objects, the principal difference being that, when using a chart on Mercator's Projection, true bearings have to be changed into mercatorial bearings, the D.F. stations being generally at very much greater distances than the objects used in an ordinary cross bearing fix.

Although fixing position by D.F. bearings is dependent for its accuracy upon the degree of precision with which it is at present possible to determine the direction of wireless waves, subsequent confirmation of the course and distance made good, by the receipt of additional bearings, would afford confidence to those responsible in the vessel as the land is approached under weather conditions that preclude the employment of other methods.

At the present time, from shore stations with practised operators and instruments in good adjustment, the average error in direction should not exceed 2° for day working, but it

Scales for obtaining the Convergency for 10' Diff. Longitude in different Latitudes



Example:— Mid. Lat. $50^{\circ}30'$, diff. long. 282'. To find the Convergency.
Under $50^{\circ}30'$ on Mid. Lat. scale read 7.7 on scale of Convergency
which multiplied by 28.2 gives 217' the Convergency

Fig. 1.

is to be noted that errors at night may be larger, although sufficient data on this point is not at present available.

Further experience in fixing the position of a ship by D.F. bearings has shown that one or more of several causes may occasionally operate to vitiate the accuracy of the bearings obtained.

Bearings may be unreliable at night and during stormy weather; also when the direction runs approximately parallel with the coast line, or passes alternately over sea and land.

Due caution should, therefore, be exercised when using this method for determining a ship's position, and the mariner should not neglect to take the usual precautions during thick weather, such as the use of the lead, etc., more particularly when closing the land, or navigating in the vicinity of reefs and other isolated submerged dangers.

II.—TRACK OF WIRELESS WAVE.

The track of a wireless wave being a great circle is represented on a chart on Mercator's Projection by a flat curve, concave towards the equator; this flat curve is most curved when it runs in an east and west direction, and flattens out as the bearing changes towards north and south. When exactly north and south it is quite flat, and is then a straight line (*i.e.*, the meridian). The true bearing of a ship from a W/T station, or *vice versa*, is the angle contained by the great circle passing through either position and its respective meridian.

III.—CONVERGENCY.

Meridians on the earth's surface not being parallel but converging towards the poles, it follows that a great circle will intersect meridians as it crosses them at a varying angle. The difference in the angles formed by the intersection of a great circle with two meridians (*i.e.*, convergency) depends on the angle the great circle makes with the meridian, its middle latitude between the meridians, and the difference of longitude between the meridians.

This difference is known as the convergency, and can be approximately calculated from the formula:—

Convergency in mins. = diff. long. in minutes \times sin mid. lat.

Convergency may be readily found from the Convergency Scale (Fig. 1) or it may be found by traverse table entering the D. long. as distance and mid lat. as course; the resulting departure being the convergency in minutes.

IV.—TRUE AND MERCATORIAL BEARINGS.

Meridians on a Mercator's chart being represented by parallel lines, it follows that the *true bearing* of the ship from the station, or *vice versa*, cannot be represented by a straight line joining the two positions, the straight line joining them being the *mean mercatorial bearing* which differs from the true bearing by $\pm \frac{1}{2}$ the convergency. As it is this mean mercatorial bearing which we require, all that is necessary when the true bearing is obtained from a D.F. station is to add to or subtract from it $\frac{1}{2}$ the convergency and lay off this bearing from the station.

V.—SIGN OF THE $\frac{1}{2}$ CONVERGENCY.

Provided the bearings are always measured in degrees North 000° to 359° (clockwise) the sign of this $\frac{1}{2}$ convergency can be simply determined as follows:—

N. lat. ... $\frac{1}{2}$ convergency is + to the bearing given by the D.F. station when ship is E. of station.

N. lat. ... $\frac{1}{2}$ convergency is - to the bearing given by the D.F. station when ship is W. of station.

S. lat. ... The opposite.

When the W/T station and the ship are on opposite sides of the equator, the factor sin mid. lat. is necessarily very small and the convergency is then negligible. All great circles in the neighbourhood of the equator appear on the chart as straight lines, and the convergency correction as described above is immaterial and unnecessary.

VI.—EXAMPLE.

A ship is by D.R. in lat. $48^\circ 45' N.$, long. $25^\circ 30' W.$, and obtains D.F. bearings from Sea View $244\frac{1}{2}^\circ$, and from Ushant $277\frac{1}{2}^\circ$. What is her position?

Sea View	Lat. $55^\circ 22' N.$	Long. $7^\circ 19\frac{1}{2}' W.$
D. R.	„ $48^\circ 45' N.$	„ $25^\circ 30' W.$

Mid. lat.	$52^\circ 03' N.$	Diff. long. $1090.5'$
Convergency = $1090.5' \times \sin 52^\circ = 859'$		
or $\frac{1}{2}$ convergency = $7^\circ 09'$		

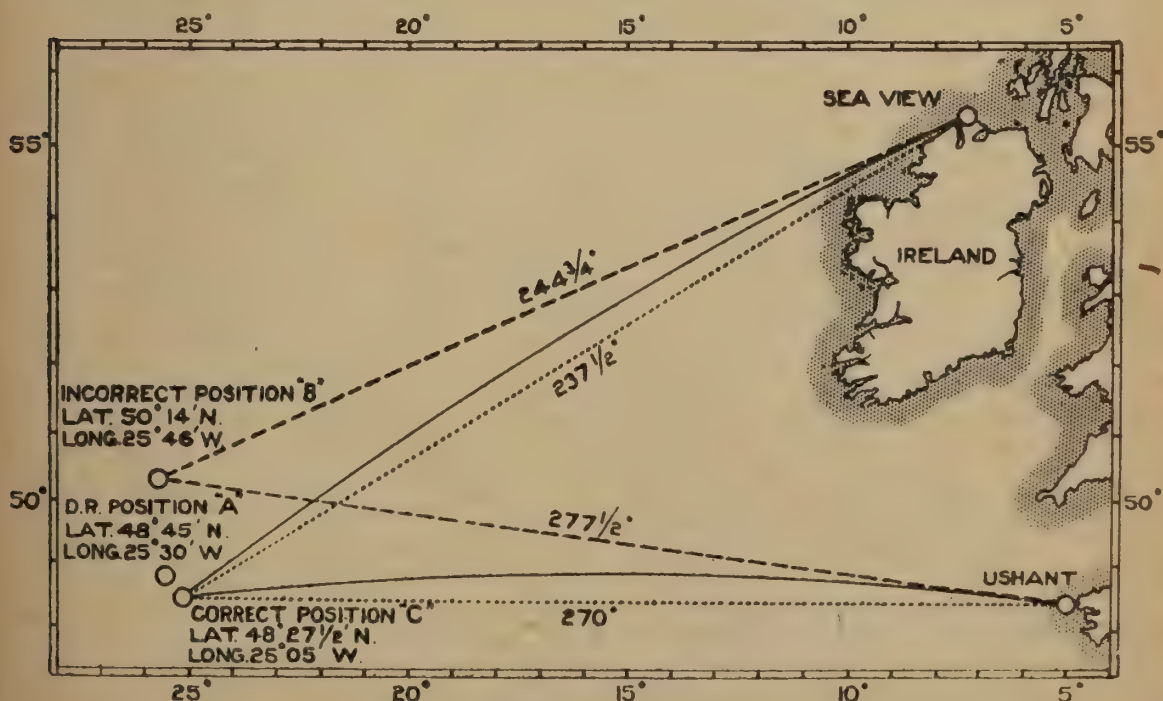


Fig. 2.

The true bearing signalled by Sea View was $244\frac{1}{2}^{\circ}$, as ship is west of the station (North lat. see paragraph V.), the $\frac{1}{2}$ convergency will be "minus" to the true bearing signalled. Therefore the mercatorial bearing will be $237\frac{1}{2}^{\circ}$ nearly.

Similarly with Ushant.

Lat. D. R.	$48^{\circ} 45' N.$	Long. $25^{\circ} 30' W.$
„ Ushant	$48^{\circ} 26\frac{1}{2}' N.$	„ $5^{\circ} 05\frac{1}{2}' W$
Mid. lat.	$48^{\circ} 36' N.$	Diff. long. $1224.5'$
Convergency	$1224.5' \times \sin 48^{\circ} 36' = 919'$	
	or $\frac{1}{2}$ convergency = $7^{\circ} 40'$	

The true bearing signalled by Ushant was $277\frac{1}{2}^{\circ}$, as ship is west of the station (North lat. see paragraph V.), the $\frac{1}{2}$ convergency will be "minus" to the true bearing signalled. Therefore the mercatorial bearing will be 270° nearly. Laying off $237\frac{1}{2}^{\circ}$ and 270° on the chart from Sea View and Ushant respectively the intersection will be in:
Lat. $48^{\circ} 27\frac{1}{2}' N.$, long. $25^{\circ} 05' W.$, which is the ship's position.

Note.—In plotting the positions the largest scale chart available that embraces the area should be used. A station pointer will be found convenient for laying off the bearings where the distances are great.
The chartlet (Fig. 2), drawn on the Mercator's Projection shows the above positions and the error involved by laying off the true bearings as signalled from Sea View and Ushant.
The solid lines are the great circles passing through Sea View and ship's position and Ushant and ship's position.
The pecked lines are the true bearings laid off as signalled, their intersection (B) being in lat. $50^{\circ} 14' N.$, long. $25^{\circ} 46' W.$, or approximately $110'$ from the correct position.
The dotted lines are the mean mercatorial bearings laid off from Sea View and Ushant and their intersection (c) gives the ship's position very nearly i.e., lat. $48^{\circ} 27\frac{1}{2}' N.$, long. $25^{\circ} 05' W.$
Position A is the ship's D.R. position, lat.

$48^{\circ} 45' N.$, long. $25^{\circ} 30' W.$, which was used for calculating the $\frac{1}{2}$ convergency.
Note.—As the true position of the ship should have been used to obtain the $\frac{1}{2}$ convergency the quantity found is not correct, but it could be recalculated using lat. and long. (c) and a more correct value found. This, however, is only necessary if the error in the ship's assumed position is very great.

VII.—ACCURACY OF THIS METHOD OF PLOTTING.
Although this method is not rigidly accurate, it can be used for all practical purposes up to 1,000 miles range, and a very close approximation found to the position lines upon which the ship is at the moment the stations receive her signals.

VIII.—USE OF D.F. BEARINGS WITH OBSERVATIONS OF HEAVENLY BODIES.
It follows that D.F. bearings may be used in conjunction with position lines obtained from observations of heavenly bodies, the position lines from the latter being laid off as straight lines (although in this case also they are not strictly so), due consideration being given to the possible error of the D.F. bearings. Moreover D.F. bearings can be made use of at short distances as "position lines," in a similar manner to the so-called "Sumner line" when approaching port, making the land, avoiding dangers, etc.

IX.—CONVERSE METHOD.
When ships are fitted with apparatus by which they record the D.F. bearings of shore stations whose positions are known, the same procedure for laying off bearings from the shore stations can be adopted, but it is to be remembered that in applying the $\frac{1}{2}$ convergency to these bearings it must be applied in the converse way, in both hemispheres, to that laid down in paragraph V.

REGULATIONS FOR THE USE OF D.F. STATIONS.
Acts and Decrees affecting direction finding stations of certain countries are to be found in the "Laws and Regulations" section of this publication on pages 36 to 467.

CANADA

Independent direction finding stations established by the Canadian Government are given in Table I.

TABLE I.

Country.	W/T Station.	Call Signal.	Latitude N.	Longitude W.	Wave-length (metres)	Range (miles)
CANADA (Nova Scotia))	Chebucto Head	VAV	44 30 01	63 31 20	800	250
	†St. Paul I.	VAT	47 12 15	60 08 45	800	250
	Canso	VAX	45 19 24	60 58 25	800	100
	Yarmouth	VAU	43 46 24	66 07 16	800	—
	St. John	VAR	45 15 04	66 09 47	800*	250
CANADA (New Brunswick)						
CANADA	†Heath Point Light Vessel	VCI	49 03 05	61 30 19	1,000 (spk.)	50
CANADA (British Columbia)						
Pachena	VAD	48 44 00	125 06 25	800	200	
NEWFOUNDLAND and LABRADOR						
Cape Race	VAZ	46 39 10	53 05 05	800	250	

* After communication has been established on 600 metres.
† Constant watch is maintained on 800 metres.
During the closed season of navigation in the Gulf of St. Lawrence this station maintains a united watch on 800 metres, as follows, Eastern Standard Time (Long. 75 degs. W.) :—
The first half hour of every odd hour from 0900 to 1400.
Constant watch from 1500 to 0730.
Should a ship anticipate that she will require bearings at times other than those included in the above periods of watch, she should inform the D.F. station, either directly or through another

Canadian D.F. station, when arrangements will be made for St. Paul I. D.F. station to be on watch at the required time.

Constant 24-hour watch is resumed by this station on the opening of navigation in the Gulf of St. Lawrence.

† Wireless fog signals are automatically transmitted on a wavelength of 1,000 metres with a spark frequency of 500. The characteristic of the signals will be a series of groups of four dashes transmitted for 60 sec. (the elapsed time from the beginning of one group to the beginning of the next being 4 sec.), followed by a silent interval of 4 min., thus:—

— — — — — &c. Silence
1 min. 4 min.

In foggy weather, the automatic transmitter will be in operation on 1,000 metres continuously, except when the operator is on watch.

The operator will maintain watch on 600 metres during the following hours, Eastern Standard Time (Long. 75 degs. W.) :—

0700—0730	1100—1130	1500—1530	1900—1930
0900—0930	1300—1330	1700—1730	2200—2230

If during the period the operator is on watch, a ship should require the light vessel to transmit signals for D.F. purposes, the request for such signals should be made on 600 metres. The light vessel will then acknowledge the request on that wavelength, after which she will immediately transmit the automatic signal on 1,000 metres, as mentioned above.

No charge is made for this service.

Masters of vessels equipped to receive these signals are requested to listen when within range of this station and report the results to the Director of Radio, Department of Marine and Fisheries, Ottawa.

N.B.—Heath Point Light-vessel is withdrawn during the winter months.

REGULATIONS FOR THE USE OF CANADIAN D/F STATIONS.

1. A ship wishing to obtain her bearings should call the D.F. station required on 800 metres, except St. John, as noted above, and transmit the signal QTE? using commercial procedure as follows:—

EXAMPLE.

Ship (call sign CHR) calls up station required (call sign VAV) :—

— • — • — VAV VAV VAV — • — • — CHR
CHR CHR QTE • — — — — • — — — —

The D.F. station on acknowledging the receipt of the signal QTE? will say whether it is ready to take the bearing at once, or whether the ship is required to wait.

If the D.F. station is ready to take the bearing, it will make :—

CHR R QTE VAV — • — —

2. On receiving this acknowledgment of the signal QTE? and the signal — • — — (go) the ship will make : — • — — — — — etc. (• — — — — repeated 30 times) • — — — — CHR.

3. If the D.F. station is not satisfied with the bearing it will make • — — — — to the ship, which will repeat • — — — — 20 times (as above); otherwise the D.F. station does not answer until the bearing has been worked out, when the station will immediately call the ship and transmit the TRUE bearing of the ship from the station in degrees from 000° to 359°, in Government message form, all angles being measured clockwise from true North (000°).

4. Should a ship be within range of and wish to obtain her bearings from more than one D.F. station, she should, if possible, call up the individual stations required, and carry out the above procedure simultaneously with all stations in order to avoid undue interference.

5. Well tuned, clear signals, of medium or fair strength, are essential for accurate direction finding. The D.F. station will, if necessary, direct the ship to increase or decrease power so that signals are not stronger than desirable. Care must be taken to keep the note and strength of signals steady, and pay proper attention to spacing. The sharper the tuning, the more accurate will be the bearing; therefore, coupling should be as loose as possible, consistent with the required strength of signals.

6. It must be understood that D.F. station bearings are susceptible to errors at night, and also when the bearing lies roughly along the coast line.

Under normal conditions errors are not likely to exceed 2°.

If conditions are such that the error may exceed 1°, then the bearing will be given as approximate, this being denoted by the suffix "app" to the bearing, e.g., "App 148 degrees." The error in these approximate bearings is not likely to exceed 4°, and will generally not exceed 2½°.

Ships should note that a D.F. station cannot distinguish between the bearing of the ship and its reciprocal, unless the reciprocal bears inland. In case of doubt, the station will give the ship the two possible angles from true North, the decision being left to the ship as to which is her correct bearing. When two angles are given they will not necessarily differ by the theoretical 180°, since there may be deviation corrections applied by the D.F. station, which vary slightly at opposite points of the compass.

7. The operator must not ask for a bearing except when instructed to do so by the master of the vessel.

8. No charge will be made by the Canadian Government for the above service until further notice.

FRANCE, TUNISIA AND MOROCCO

TABLE II.

Country.	W/T Station.	Call Signal.	Latitude. N.	Longitude	Wave-length (metres)	Range (miles).
FRANCE (Channel and Bay of Biscay)	Bernières	FEB	49 20 00	0 25 00 W.	450**§ 800	120
	Cherbourg	FUC	49 36 32	1 36 00 W.	450** 800	200
	Tréguier—St. Gonery	FET	48 50 13	3 13 56 W.	450** 800	120
	Ushant (Ouessant)- Niow Huella	FEU	48 27 40	5 06 50 W.	600***	—
	††Brest—La Trinité ..	FEX	48 21 53	4 35 18 W.	2,100 (C.W.)	—
	****†Brest—Moulin du Seigneur	FEI	48 19 36	4 33 14 W.	450** 800	300
	Pointe du Raz ..	FER	48 02 20	4 43 52 W.	450** 800	120
	†Penmarc'h	FEP	47 48 30	4 21 01 W.	450** 800	120
	Lorient	FUN	47 44 05	3 20 45 W.	450**§ 800	300
	†St. Nazaire—Ville-ès- Martin	FEZ	47 15 24	2 13 49 W.	450** 800	120
	Rochefort—Soubise ..	FES	45 56 00	1 00 00 W.	450**§ 800	120
	§†Toulon—La Mitre ..	FEM	43 06 13	5 55 53 E.	800||	300
TUNISIA	Bizerta—Seti Meriem	FEQ	*37 14 42	*9 50 03 E.	450** 800	—
MOROCCO	§Qnitra (Kenitra) ..	CNK	*34 18 49	*6 36 00 W.	450 600 800 (spk.)	120
	Casablanca—Chetaba Casablanca, Maroc ..	CNP CNP	33 35 21 33 36 32	7 34 10 W. 7 37 59 W.	800 600	300 430

* Position approximate.

† Station closed until further notice.

‡ Connected to Brest—Mengam W/T (FUE) which will provisionally employ a wavelength of 2,400 metres (C.W.) for replying to requests for bearings and transmitting the results. Bearings on a wavelength of 2,100 metres (C.W.) are obtained by first calling Mengam on 2,400 metres (C.W.).

** In exceptional cases a wavelength of 600 metres can be used.

*** Transmitting station: Ouessant (FFU).

**** Transmitting station: Brest—Mengam (FUE).

§ Temporarily closed.

¶ Bearings are transmitted by Toulon—Mourillon (FUT) on 600 metres wave.

|| *Errors in Bearings.*—In the sectors 080°—100° and 130°—140° there is a probable error of 007° to 008° in the bearings transmitted from La Mitre D.F. station. Mariners are warned accordingly.

REGULATIONS FOR D/F STATIONS IN FRANCE, TUNISIA AND MOROCCO.

A.—Low Power D.F. STATIONS.

1. French low power D.F. stations keep watch on a wavelength of 600 metres (damped), which must be used for calling by ships desirous of obtaining their bearings.

The D.F. station called replies on the same wave.

The bearing wave (*i.e.*, the wave on which the ship transmits the signal permitting the station to make the observation for the bearing) is either 800 metres or 450 metres, at the option of the ship. The wavelength of 600 metres can be used by ships which cannot transmit either on 450 or 800 metres.

The result of the observation is transmitted by the D.F. station on the same wavelength. Toulon and Casablanca, however, always transmit the result on 800 metres, whatever the bearing wave may be.

2. The abbreviations used are:—

QTE? = What is my true bearing relatively to you or to ?

QTE = Your true bearing relatively to me or to is

The bearings are indicated by a number consisting of three figures. They are reckoned from 000° to 359° clockwise, thus: North = 000° West = 270°.

3. A ship desires bearings from a single station or simultaneously from several stations.

The procedure to be observed is as follows:—

(a) The ship calls the station (or stations) on the 600 metre wave, and transmits the signal "QTE?" followed by the call signals of all the stations from which she requires observations, and a number indicating the wavelength to be used. She then listens on 600 metres.

(b) The D.F. stations called prepare to take the bearings, and, when ready, reply in the alphabetical order of their call signals,

directing the ship by the signal K to commence transmission: this signal is followed by a figure giving the intensity of the signal (scale=1 to 9) to be made by the ship.

(c) On receiving the signal K the ship adjusts her transmitting gear accordingly, and sends her own call signal for 50 seconds, she then listens on the same wave.

(d) The station, replying in the alphabetical order of their call signals, give the results of their observations by the signal QTE followed by a group of three figures indicating the bearings; or may, if necessary, ask the ship to repeat the preceding message.

EXAMPLE.

A ship ABC requires bearings from the D.F. stations Brest—Moulin du Seigneur (FEI) and Ouessant (FEU), on a wavelength of 450 metres.

The various operations are effected in the following order:

(a) ABC calls on 600 metres the two stations:

VE FEI FEI FEU FEU V ABC QTE?
FEI FEU 450 AR.

ABC having transmitted this signal listens on 600 metres.

(b) FEI replies on 600 metres:

VE ABC V FEI 450 K 6
FEU replies on 600 metres:
VE ABC V FEU 450 K 7

(c) FEI and FEU adjust their receiving apparatus to 450 metres.

ABC also adjusts her receiving apparatus to 450 metres, and signals:—

VE FEI FEU V ABC ABC ABC.....(for 50 seconds) AR

ABC then listens on 450 metres.

(d) Both shore stations having made the necessary observations, find that at 1545 G.M.T. (civil):

FEI 330° FEU 010°
FEI thereupon signals on 450 metres:
VE ABC V FEI 1 BT 1545 QTE 330 AR
FEI
ABC acknowledges receipt by making:
VE FEI V ABC R II VA
FEU then signals on 450 metres:
VE ABC V FEU 3 BT 1545 QTE 010
AR FEU

ABC acknowledges receipt by making:

VE FEU V ABC R II VA

All stations concerned after repeating VA resume their normal service.

NOTE.—(1) The figures 1 and 3 before the signal BT give the registered number of the bearing on the station register; 1545 refers to the civil mean time of the meridian of Greenwich (the first two figures representing the hours, and the last two the minutes).

(2) If one of the stations (e.g., FEU) desires to repeat the message the bearing not having been made correctly at the first transmission, it makes the signal:

VE ABC V FEU UD

The ship again repeats her call signal for 50 seconds as in (c); the remaining portion of the message is then sent as stated.

B.—HIGH POWER D.F. STATIONS.

The procedure to follow for obtaining bearings is analogous to that indicated for low power stations.

The wavelengths for watchkeeping and for the bearing are the same, viz., 2,100 metres (continuous wave).

If the D.F. station is connected to a W/T station keeping permanent watch on 2,400 metres (C.W.), a ship can ask for the bearing on 2,100 metres (C.W.) by applying to the D.F. station on 2,400 metres (C.W.) (e.g., Brest—La Trinité D.F. is connected to Brest—Mengam W/T).

In this case the wavelength of 2,400 metres (C.W.) is used for calling only; and the wavelength of 2,100 metres (C.W.) is used for all the signals that follow.

CHARGE.—A charge of six francs is made for each bearing.

NOTE.—The French Government decline all responsibility so far as the accuracy of the bearings transmitted is concerned.

CAUTION.—When the bearing between the ship and the D.F. station is parallel, or nearly so, with the general trend of the coast, its accuracy cannot be relied on. The error under such conditions may be as large as 10°. It is necessary, therefore, to warn ships against the use of D.F. bearings, when the angle between the line of bearing and the coast is less than 20°. If, however, circumstances necessitate the acceptance of a bearing under these conditions, the amount of possible error must always be taken into account.

FRENCH INDO-CHINA

TABLE III.

Country	W/T Station	Call Signal	Latitude N.	Longitude E.	Wave length (metres)	Range (miles)
FRENCH INDO-CHINA			° ' "	° ' "		
	Kien an	HVB	*20 47 00	*106 37 00	600	150
	Kak Ba	HVC	*20 44 00	*107 02 05	600	80

* Position approximate.

These stations work in conjunction with each other.

GERMANY

TABLE IV.

Country	W/T Station	Call Signal	Latitude N.	Longitude E.	Wave-length (metres)	Range (miles)
GERMANY	Borkum	KBO	53 34 51	6 41 42	800	300
	Wilhelmshaven (Third Entrance)	KAN	53 31 16	8 09 33	600	—
	*† Nordholz	KBN	53 46 51	8 38 42	800	300
	List	KAL	50 00 00	8 23 02	800	300

* D.F. Control Station.

† NOTE.—Experience shows that the angles in the sector 250 deg.-300 deg., transmitted by this station average $1\frac{1}{2}$ degs. in excess of the correct bearing. The station now applies a correction of $-1\frac{1}{2}$ degs. to the bearing in this sector. No correction is therefore necessary by the ship requesting the bearing.

REGULATIONS FOR D.F. STATIONS IN GERMANY.

The regulations now in force for the D.F. service in Germany are as follows:—

1. GENERAL.

The three German D.F. stations (Borkum, Nordholz and List) in the North Sea generally determine the bearings simultaneously; each station also furnishes on demand individual (or single) bearings. In the former case the three stations operate under the direction of the W/T Control Station (Nordholz), which transmits the bearings to the ship demanding them. When an individual bearing is required, the ship communicates direct with the W/T station of the D.F. station concerned.

2. WAVELENGTH.

The wavelength employed for calling, communicating, and determining the bearing is that of 800 metres, exclusively.

3. CALLING AND METHOD OF PROCEDURE.

(A) Bearings from three D.F. stations.

The ships call the control station, Nordholz (call signal KBN) in the usual manner on the 800 metres wave, using the abbreviation:

QTE? = What is my true wireless bearing?

KBN acknowledges the signal, and when the D.F. stations are ready to determine the bearing, sends the signal K (— ● —).

The ship proceeds to transmit her call signal for one to two minutes on the 800 metres wave (sharp tuning is necessary), prolonging the dashes a little; she then waits for KBN's reply:

QTE = Your true bearing is degrees.

The ship acknowledges the receipt of the bearings in the usual manner, repeating the figures, followed by the end of work signal, which is repeated by KBN.

The time given in the message is Central European Time (0000—2359), commencing at midnight, the first two figures denoting the hours and the last two the minutes. The bearings in degrees are given clockwise from the D.F. station concerned; and they are transmitted immediately after the call signal of the D.F. station.

When a vessel does not require bearings, but her geographical position determined from bearings, she should use the abbreviation:

QTF? = What is my ship's position by wireless bearing?

The method of procedure is similar, except that KBN, instead of transmitting bearings, gives the position of the ship in latitude and longitude as in the following example:—

— ● ● ● — 54 — ● ● ● — 11 — ● ● ● —
Nord (54° 11' N.);

— ● ● ● — 6 — ● ● ● — 50 — ● ● ● —
30 — ● ● ● — Ost (6° 50' 30" E.);

or, by the aid of two groups of four figures and one group of two letters, which signify:

(a) 1st group of four figures equals degrees and minutes of latitude;

(b) 2nd group of four figures equals degrees and minutes of longitude;

(if the number of degrees and minutes is less than 10, the figure of the tens is replaced by 0, thus, 05 = 5°).

(c) In the 3rd group the first letter indicates the latitude (N=North, S=South), and the second that of the longitude (O=Ost (East), W=West).

(B) Individual bearings.

The ship calls direct, on 800 metres wave, the W/T station belonging to the D.F. station concerned. The preliminaries are the same as those already indicated under (A), both for the shore station and the ship.

4. ACCURACY OF D.F. BEARINGS.

(a) All necessary precautions are taken in order that the bearings are determined as accurately as possible. Nevertheless, vessels are warned that no responsibility can be accepted by the German Naval Directorate in respect of erroneous D.F. bearings and their consequences.

(b) The conditions that should be fulfilled for obtaining a good bearing are to transmit consistently clear, steady signals of medium power, on a sharply tuned wave.

(c) When the coast line is nearly parallel with that of the direction of the bearing, the latter is subject to large variation; a similar divergence occurs when the line of bearing passes over sea and land alternately, and also at sunset. Vessels are therefore not recommended to ask for bearings when these conditions prevail.

(d) The bearings transmitted by List D.F. station (Blidselbucht) are inaccurate in the sector, the limits of which are approximately: List D.F. station—Rotersand Light, and List D.F. station—Karolinsiel Mill. For this sector the bearing will be given as "187 bis 194" (187° to 194°). In the event of any vessel finding herself in this sector, and no other method of determining her position being available, the mean bearing of 190° may be assumed, if deemed advisable.

(e) Ships are recommended to make frequent use of the D.F. stations more particularly in clear weather when the position can be checked, in order the familiarise themselves with D.F.

procedure and become acquainted with the accuracy of D.F. bearings.

5. REPORTS.

The navigator who knows his exact position can furnish very valuable data on the correctness of D.F. bearings, and is invited to forward a brief report to the Chef der Marineleitung, Berlin, containing the following information :—

Name of ship.

Date, hour and minutes of D.F. bearing.

Position of ship in latitude and longitude (degrees and minutes).

Name of D.F. station.

True bearing of ship from D.F. station, according to exact position.

D.F. bearing.

D.F. bearing error.

Distance of ship from D.F. station.

Position of ship according to the control station.

Wavelength.

Was the true bearing of the ship correct?

Weather and general remarks.

6. CHARGES.

Until further notice no charge is made for the D.F. service.

7. EXAMPLE.

Nordholz Control Station call signal—KBN
S.S. "Kleist" call signal—DST.

Borkum W/T—KBM Borkum D.F.—KBO
List W/T—KAL List D.F.—KAO

(a) S.S. "Kleist" requires bearings from each of the three D.F. stations.

1015 (800 m.) —●—●—●— KBN KBN V (de)
DST DST —●—●—●— QTE ●—●—●—●—

1016 (800 m.) —●—●—●— DST DST V (de)
KBN KBN ●—●—●—●— ●—●—●—●—

1017 Call of the Control Station to the D.F. stations on a wavelength other than 800 metres :
"Peilung DST" (Bearing DST).

1018 (800 m.) —●—●—●— DST DST V (de)
KBN —●—●—●—

1018 (800 m.) —●—●—●— KBN KBN V (de)
DST —●—●—●— DST DST DST (call signal, for one to two minutes, prolonging the dashes)
—●—●—●— DST ●—●—●—●—

1019 The D.F. stations transmit their results on a wavelength other than 800 metres to KBN).

1021 (800 m.) —●—●—●— DST DST V (de)
KBN —●—●—●— QTE 1018 KAO 221 KBN
275 KBO 357 —●—●—●— KBN ●—●—●—●—

1022 (800 m.) —●—●—●— KBN KBN V (de)
DST —●—●—●— 1018 221 275 357 ●—●—●—●—

1023 (800 m.) —●—●—●— DST DST V (de)
KBN —●—●—●—●—●—●—●—●—●—

Remarks.—Communications between KBN and the D.F. stations are exchanged on a wavelength other than 800 metres, so as not to interfere with the messages on that wave.

GREAT BRITAIN

For particulars of D/F stations for aircraft, see the Aviation Section, pages 567 to 594.

TABLE V.

Country	W/T Station	Call Signal	Latitude N.	Longitude W.	Wavelength (metres)	Range (miles)
GREAT BRITAIN	*Niton	GNI	50 34 42	1 17 10	600	100
	†Cullercoats	GCC	55 12 15	1 25 29	600	100
	**Flamborough	BVN	54 06 50	0 04 56	450	—
	Lizard	BVY	49 59 06	5 12 24	800	—

* The reliable range of this station for D.F. purposes is 100 miles ; up to this range, and within the sectors 060 deg.-080 deg., 120 deg.-260 deg. and 280 deg.-290 deg., an accuracy of 002 deg. may be expected.

† The reliable range of this station for D.F. purposes is 100 miles ; up to this range and within the sector 350 deg.-125 deg. an accuracy of 002 deg. may be expected.

** It is possible that the wavelength of this station may shortly be altered from 450 to 600 metres.

REGULATIONS FOR BRITISH D.F. STATIONS.

(1) The charge for each bearing will be 5s., the amount being collected from the administration controlling the ships concerned in accordance with the present system of collecting charges for W/T commercial messages. Charges in respect of the Lizard D.F. station will be collected by the Accountant General of the Navy and of the remaining three D.F. stations by the General Post Office.

(2) The accuracy with which the bearings can be taken depends on the conditions outlined below ; but, although all necessary precautions are taken in order that the bearings may be determined as accurately as possible, the Administration cannot accept any responsibility for the consequences of a bearing being inaccurate.

The conditions which should be fulfilled for obtaining a bearing are to transmit consistently clear, steady signals, on a sharply tuned wave.

(3) Bearings at distances exceeding 100 miles will be given if required, but the degree of reliability decreases as the range increases, especially at night.

(4) Bearings in sectors other than those enumerated above will be given, but will be definitely stated as "unreliable," because variable errors are experienced in such sectors.

(5) Bearings at night are subject to variation and should be accepted with caution.

(6) If a bearing is not of the highest order it will be specified as "approximate."

(7) If a satisfactory bearing cannot be obtained, the station will inform the ship that conditions are unfavourable and that another call should be made later.

(8) Procedure (taking Niton as an example).

(a) The ship calls Niton (GNI) on 600 metres, making the abbreviation "QTE?" = What is my true bearing from you?

(b) Niton, when ready, answers and sends K (—●—●—).

- (c) The ship then makes her call signal for 60 seconds and awaits the result.
- (d) Niton replies, either by asking the ship to repeat, if not satisfied with the bearing, or by making the abbreviation "QTE" = Your bearing from me was . . . degrees, followed by a group of three figures (000 - 359) indicating the bearing in degrees from true North, measured clockwise, of the ship from Niton.
- (e) In all messages the time is expressed in G.M.T. (civil) by the four-figure notation, the first two figures denoting the hour and the last two figures the minutes, with the day commencing at midnight and the hours reckoned from 00 to 23.
- (f) The ship, on receiving the result, repeats back the message to Niton, who will then acknowledge or repeat if necessary, and when satisfied that the ship has received the message correctly will make the "end of work" sign. This signal is repeated by the ship, indicating that the operation is finished.

EXAMPLE I.

A ship (call signal XYZ) requires a bearing from Niton (GNI). The following signals are exchanged on 600 metres:—

(Ship): CT GNI GNI de XYZ QTE ? AR.

(Niton): CT XYZ de GNI K AR.

(Ship): CT GNI de XYZ XYZ XYZ, etc.
(for 60 sec.), XYZ AR.

Niton being satisfied that the true bearing is 235° makes:

CT XYZ XYZ de GNI 1 0945 (time) BT QTE 235 AR GNI.

(Ship): CT GNI de XYZ 1 0945 BT QTE 235 AR XYZ.

(Niton): XYZ de GNI R SK.

(Ship): GNI de XYZ SK.

If not satisfied with the bearing, GNI asks XYZ to repeat thus:—

CT XYZ de GNI UD AR.

XYZ complies by making:

CT GNI de XYZ XYZ, etc. (for 60 secs), XYZ AR.

Niton now being satisfied that the true bearing is 235° makes:

CT XYZ XYZ de GNI 1 0947 BT QTE 235 AR GNI.

(Ship): CT GNI de XYZ 1 0947 BT QTE 235 AR XYZ.

(Niton): CT XYZ de GNI R SK.

(Ship): CT GNI de XYZ SK.

EXAMPLE II.

A ship (call signal XYZ) desires a bearing from Niton.

The procedure described in (8), (a), (b), (c) is followed.

Niton finds that the bearing is apparently 072°, but does not consider that the bearing obtained is of the highest order, and transmits

CT XYZ XYZ de GNI 1 2208 BT QTE 072 approximate AR GNI.

The procedure detailed in (8) (f) follows.

EXAMPLE III.

A ship (call signal XYZ) desires a bearing from Niton.

The procedure shown in (8) (a), (b), (c) is followed.

Niton finds that the bearing is apparently 260° and, as this is in one of the sectors in which variable errors are experienced, transmits:

CT XYZ XYZ de GNI 1 1428 BT QTE 269 unreliable AR GNI.

The procedure detailed in (8) (f) follows.

EXAMPLE IV.

A ship (call signal XYZ) desires a bearing from Niton.

The procedure described in (8) (a), (b), (c) is followed.

Niton, however, is unable to obtain a satisfactory bearing, so transmits:

CT XYZ XYZ de GNI 1 0623 BT QTE conditions unfavourable, make another call later AR GNI.

(Ship): CT GNI de XYZ R SK.

(Niton): CT XYZ de GNI SK.

NOTE. — BEARING OF D.F. STATION OBTAINED BY SHIP'S D.F. INSTALLATION.

Occasionally ships that are equipped with D.F. installations may prefer to take the direct bearing of the shore D.F. station by means of their own apparatus. For this purpose Lizard and Flamborough D.F. stations are available in the British Islands.

The following procedure is recommended in this case:

Using the appropriate wavelength mentioned above, the ship calls the shore D.F. station in the usual manner, and on receiving an acknowledgment, repeats the signals, terminating with QTG — Please transmit your station's call sign for one minute in order that a D.F. bearing may be obtained.

A charge of 5s. is debited to the ship concerned in respect of each transmission.

The above procedure is identical with that to be used in obtaining bearings of ordinary W/T stations, except that it is essential to employ the normal wavelength of the W/T station called.

HONG KONG

TABLE VI.

Country.	W/T Station.	Call Signal.	Latitude N.	Longitude E.	Wave-length (metres)	Range (miles)
HONG KONG	Cape d'Aguilar (Tai long head)	VPS	22 12 37	114 15 30	450 800	— —

REGULATIONS FOR HONG KONG
D.F. STATION.

A ship requiring a bearing should call Cape d'Aguilar D.F. station in accordance with the procedure outlined below, and the latter will

reply giving the true bearing of the ship from the station, expressed in degrees (000° to 359°). In all messages giving bearings the time used is G.M.T. (civil).

The station keeps continuous watch on the

600 metres wavelength; bearings, however, will be taken either on 450 or 800 metres, as requested, and the reply transmitted on 600 metres.

The following signals are to be used:

Signal. Meaning.
QTE ? = What is my true bearing from you ?
QTE = Your true bearing from me was
..... degrees.

EXAMPLE.

The ship calls the D.F. station in the usual manner on the 600 metres wave, making QTE ? in conjunction with the call signal of the station from which the bearing is required, followed by the figures 450 or 800, signifying that she will change either to 450 or 800 metres wave for the taking of the bearing.

The ship then awaits instructions from the D.F. station, which will be transmitted on the 600 metres wave.

In order to obtain the greatest possible degree of accuracy, it is important that ships should not transmit with too much power. Signals should, however, be fairly strong and clear; great care must be exercised to keep the note and strength steady, and to pay strict attention to spacing; and the instructions should be rigidly observed.

WARNING.

It has been reported that the bearings are badly affected by coast refraction. Mariners are warned accordingly.

CAUTION.

The accuracy with which bearings can be taken depends on certain conditions already referred to in the introduction to this section. But, although the bearings taken by the D.F. station can generally be considered accurate within two degrees, it must be distinctly understood that the Hong Kong Government provide this service on the express condition that they incur no liability for any consequences resulting directly or indirectly from any inaccuracy in the bearings given, from any failure in the service, or from any other cause whatever.

It will be of considerable assistance if ships, having obtained their positions by other methods, call the D.F. station and obtain their bearings by W/T and check the result thus obtained.

The Director of Public Works, Hong Kong, by whose department the D.F. station is being operated, will be glad to receive, either direct or through the harbour master, periodical reports from ships on the results obtained.

For the present no charge will be made for the use of this station.

ITALY

TABLE VII.

Country.	W/T Station.	Call Signal	Latitude N.	Longitude E.	Wave-length (metres)	Range (miles).
ITALY	Murano -	IRM	45 27 40	12 21 22	—	—

REGULATIONS FOR MURANO D.F. STATION.

Vessels wishing to obtain bearings from Murano D.F. station must call up Carbonera (Venice) W/T station (ICZ), and the latter, having obtained the required information from Murano, will duly transmit it to them. The bearings are true, and are given in degrees from 000° to 359°.

The procedure is as follows:—

A ship whose call signal is ABC wishes a bearing.

On a wave of 600 metres she will signal:—

CT ICZ ICZ de ABC QTE ?

Carbonera will answer:—

CT ABC de ICZ AS.

Carbonera then wires Murano; when ready Carbonera replies:—

CT ABC de ICZ K 6.

ABC after 30 seconds signals:—

CT ICZ de ABC ABC ABC, etc., for 45 seconds.

If dissatisfied with the bearing, Murano through Carbonera will ask the ship to repeat.

Carbonera signals:—

CT ABC de ICZ UD.

ABC repeats the signal as given above.

When satisfied with the bearing, which is assumed to be 170°, at 9.45, Murano will transmit it by telegraph to Carbonera, whence it is passed to the ship as follows:—

CT ABC de ICZ de IRM 9.45 M BT QTE 170 AR ICZ.

ABC acknowledges receipt:—

CT ICZ de ABC R SK.

A charge of six francs is made for each bearing transmitted by an Italian D.F. station. The charges are collected in the same manner as for wireless telegrams originating from ships.

ITALIAN SOMALILAND

TABLE VIII.

Country.	W/T Station.	Call Signal.	Latitude N.	Longitude E.	Wave-length (metres)	Range (miles)
ITALIAN SOMALILAND	Cape Guardajui.. ..	—	11 50 45	51 14 40	—	—

This station was established in August, 1924, and gives a limited service only. The position given above is approximate.

NORWAY

TABLE IX.

Country.	W/T Station.	Call Signal.	Latitude. N.	Longitude E.	Wave-length (metres)	Range (miles).
			° ' "	° ' "		
NORWAY	Utsire	L GK	59 18 10	4 54 48	—	—
	Bergen	L GN	60 24 42	5 21 54	—	—
	Röst	L FR	67 30 24	12 04 45	—	—
	Ingöy	L EI	71 04 25	24 09 20	—	—
SPITZBERGEN ..	Spitzbergen	L FG	78 02 26	14 14 27	—	—

The D.F. stations in Norway and Spitzbergen are not yet working officially, and no regulations have been published.

SPAIN

TABLE X.

Country.	W/T Station.	Call Signal.	Latitude N.	Longitude W.	Wave-length (metres)	Range (miles)
			° ' "	° ' "		
SPAIN	Ferrol—Caranza ..	E BAW	43 29 04†	8 13 06†	450	—

† Position approximate.

REGULATIONS FOR D.F. STATIONS IN SPAIN.

(1) A ship desiring to obtain her bearing calls the D.F. station on the 450 metres wave, and transmits QTE ? = What is my true bearing with respect to you ?

(2) The D.F. station prepares to observe a bearing, and, when ready, replies with its call signal followed by K (—●—), together with a number which expresses the intensity of the signals already received, according to the under-mentioned scale :

Code.	Meaning.	Code.	Meaning.
1	Hardly audible.	6	Moderately good.
2	Very faint, illegible.	7	Good.
3	Hardly legible.	8	Strong.
4	Weak.	9	Very strong.
5	Somewhat weak.		

(3) The ship repeats her call signal for 50 sec. and awaits the result. These signals should be made slowly, the dashes being considerably prolonged.

(4) The D.F. station then gives the result of the observations in degrees (0°—359° true) preceded by the time in four figures—the first two of which indicate the hour and the last two the minutes.

(5) If the D.F. station is not satisfied with the

observation, it will request the ship, by means of the signal \overline{UD} , to repeat the signals.

EXAMPLE.

(6) Caranza D.F. station (call signal EBAW) listens-out on the 450 metres wave. A ship (call signal EBC) requests it to take a bearing, and signals in the following manner :

\overline{VE} EBAW EBAW V EBC QTE AR.

When ready to observe the bearing EBAW replies :

\overline{VE} EBC V EBAW K7.

EBC then transmits :

\overline{VE} EBAW V EBC EBC, etc. (repeated for 50 sec.), EBC AR.

If EBAW is not satisfied with the observation it requests EBC to repeat, making :

\overline{VE} EBC V EBAW \overline{UD} .

(Whereupon EBC repeats as before). If the observation is satisfactory, and the result 315° EBAW transmits :

\overline{VE} EBC V EBAW 1 BT 0905 QTE 315 EBAW AR (1 BT 0905 signifies that one bearing has been taken at 9.5 a.m.)

EBC acknowledges by :

\overline{VE} EBAW V EBC R \overline{VA} .

EBAW does not reply, and both stations resume their normal routine.

SWEDEN

TABLE XI.

Country.	W/T Station.	Call Signal.	Latitude. N.	Longitude E.	Wave-length (metres)	Range (miles).
			° ' "	° ' "		
SWEDEN	Hallö	S AM	58 20 08	11 13 04	600	150
	Vinga	S AL	57 37 58	11 36 09	600	100

REGULATIONS FOR D.F. STATIONS IN SWEDEN.

Vinga and Hallö D.F. stations are not equipped with transmitting apparatus, but are controlled by Göteborg W/T station (Lat. $57^{\circ} 41' 06''$ N., Long $11^{\circ} 54' 00''$ E., call signal SAB, wave-length 600 metres).

Vessels which require bearings from Vinga and/or Hallö should first call up Göteborg. When the latter replies the vessel should signal:—

QTE? = What is the vessels true bearing from ———?
followed by the call signal of the station (or stations) from which the bearing is required.

The vessel waits for the signal K (—●—) and then sends for 50 secs. her own call signal and the signal V (●●●—) alternately, made slowly with the signals prolonged.

Göteborg replies:—

QTE = The true bearing of your vessel from — is — degrees.

This is followed by a group of four figures, which gives in degrees and tenths the bearing of the vessel from the D.F. station (000.0 = True North; 270.0 = West).

On receipt of this message the vessel repeats the group of figures and makes the "end of work" signal. This is repeated by Göteborg.

Example —

A vessel, call signal SGL, requires bearings from Vinga (SAL) and Hallö (SAM) D.F. stations.

Göteborg W/T station (SAB) is first called.

—●— SAB SAB SAB DE SGL SGL

SGL ●●●—

—●— SGL SGL SGL DE SAB SAB

SAB ●●—

—●— SAB DE SGL —●●—

QTE ●●— SAL SAM ●●—

—●— SGL DE SAB —●—

—●— SGL SGL ●●—

●●— SGL SGL ●●—

●●— etc. (for 50 secs.) ●●—

—●— SGL ●●—

(Given slowly with prolonged signals.)

—●— SGL DE SAB —●—

QTE SAL 2925 SAM 2030 —●— SAB

●●—

—●— SAB DE SGL —●●—
SAL 2925 SAM 2030 —●●— SGL
●●—
—●— SGL DE SAB ●●— SAB
●●—

A charge of 5 Kronor is made for each bearing.

The bearings are as a rule reliable, and the error does not exceed 2° of arc. Under certain conditions bearings may be inaccurate, and this is especially the case when the direction of the vessel in relation to the D.F. station is parallel, or approximately parallel, to the coast; or when the bearing crosses alternately land and sea. Experience, however, shows that bearings from Vinga across Denmark are ordinarily reliable for bearings of 270° or more.

Unless circumstances are in every way favourable mariners should not rely exclusively on the D.F. bearings, but combine them with the ordinary navigational methods of determining the ship's position.

Errors in bearings of 180° arise because the D.F. station cannot always tell on which side of the station the vessel is situated. As the correction applied by the station to the bearings is not constant, mariners should, when the bearing transmitted is apparently incorrect, refrain from employing a correction of 180° (+ or — as the case may be), but should demand a new bearing instead.

Every precaution is taken to ensure the accuracy of the bearings, but the Swedish Government do not accept responsibility for damage of any sort caused either directly or indirectly through erroneous bearings.

In order that the work of the D.F. stations may be checked, vessels are requested to send a brief account containing the following particulars to Kungl. Telegrafstyrelsens Radiobyra (The Telegraph Service Wireless Bureau), Stockholm, 2:—

- Name of vessel.
- Name of D.F. station.
- Date and time (G.M.T.) of bearing.
- Bearing given from D.F. station.
- Position of vessel at the time (by other means than D.F.).
- Probable accuracy of the calculated position.
- Meteorological conditions.

UNITED STATES OF AMERICA

TABLE XII.

Note.—The bearings shown in column 8 (all of which are expressed clockwise) are only reliable in the arc for which the D.F. station has been calibrated. The arc of calibration is the sector of the circle of which the compass coil at the D.F. station is the centre, and the bearings are observed from the fixed position of the station.

Country.	W/T Station.	Call Signal.	Latitude N.	Longitude W.	Wave-length (metres)	Range (miles)	Arc of Calibration (true).	Additional Details.
ALASKA	Cape Hinchinbrook	NRM	60 14 00	146 38 54	800	—	Degs. 110—294	Good calibration.
	† Soapstone Point	NUW	58 06 10*	136 29 30*	800	—	245—050	
UNITED STATES (Pacific coast)	Cattle Point, Wash.	NFN	48 27 04	122 57 45	800	100	120—280	Excellent calibration; bearings in sector will probably be accurate.
	Smith I., Wash.	NFH	48 18 54	122 51 32	800	100	000—359	Excellent calibration; bearings within the sector given should be accurate.
	New Dungeness, Wash.	NFT	48 10 32	123 07 51	800	100	240—110	
	Tatoosh, Wash.	NPD	48 23 28	124 44 29	800	100	180—090	The southern limit of

Position approximate.

† Limited service only. Keeps watch during thick and heavy weather.

the sector was increased to 180 deg. to provide service for shipping proceeding coastwise south of Cape Flattery. The calibration in the arc from 180 deg. to 230 deg. showed certain defects which have been provided for by directing that vessels given bearings in this sector be notified as follows: "Doubtful sector—possible error plus or minus 5 deg."

This will enable vessels to choose the error which will give them the most unfavourable position and then to steer accordingly. This warning makes allowances for possible errors in calibrations due to erratic deviation, and will permit vessels to know their position with sufficient accuracy to enable them to change course to seaward if necessary.

Country.	W/T Station.	Call Signal.	Latitude N.	Longitude W.	Wave-length (metres)	Range (miles)	Arc of Calibration (true). Degr.	Additional Details.
UNITED STATES (Pacific Coast)— <i>continued</i>	Klipsan Beach (Ocean Park), Wash.	NZS	46 27 53	124 03 16	800	100	195—340	
	Fort Stevens, Oreg.	NZS	46 11 32	123 59 15	800	100	175—335	The extension of 10 deg. in the south sector covers the indentation in the coast between the station and

Tillamook Head. The extension to 335 degs. on the northern limit of the sector cannot be considered permanent until it is determined whether North Head, where this headland intervenes between the ship and the station, has an effect on the bearings in the sector concerned.

Empire, Oreg...	NPF	43 23 03	124 18 58	800	100	230—010	—
Eureka, Calif ..	NPW	40 41 47	124 16 16	800	100	204—025	—
San Francisco entrance.							
Point Reyes, Calif.	NLG	38 02 12	122 59 36	800	100	115—005	These three stations are under the control of Point Montara D.F. station, but for the present will continue to handle bearings
Farallon I., Calif.	NPI	37 41 42	123 00 00	800	100	000—359	
Point Montara, Calif.	NLH	37 31 54	122 31 07	800	100	171—000	

independently as well as a co-ordinated group Masters of ships are informed that in making use of the San Francisco harbour entrance group they are requested to call NLH, which will obtain bearings from the remaining stations in the group and furnish them to the ship, after corrections have been applied. Otherwise the regulations for obtaining bearings are the same as on page 564.

Point Arguello, Calif.	NPK	34 34 35	120 38 32	800	100	135—000	The calibrated area between 135 deg. and 160 deg. passes over land, and bearings in this sector should be used with caution for the present.
Point Hueneme, Calif.	NMD	34 08 40	119 12 30	800	100	135—305	—
Point Fermin, Calif.	NPX	33 42 19	118 17 37	800	100	090—295	—
† Point Loma, Calif.	NPL	32 42 21	117 15 17	800	100	185—250	The station will resume service when sufficient personnel to operate it is available. Gives independent bearings while Point Loma is closed.
Imperial Beach, Calif.	NPL	32 35 14	117 07 55	800	100	180—340	—

UNITED STATES (Atlantic Coast)	Jupiter, Fla. . .	NAQ	26 56 59	80 04 57	800	150	000—160	—
	Folly Island, S.C.	NZV	32 41 00*	79 53 22*	800	100	050—210	—
	North Island, S.C.	NZW	33 13 18	79 11 10	800	100	040—220	—
	Cape Lookout, N.C.	NAN	34 36 13	76 32 15	800	100	040—260	—
	Cape Hatteras, N.C.	NDW	35 14 22	75 31 42	800	100	020—230	—
	Poyner's Hill, N.C.	NCZ	36 17 10	75 48 00	800	100	000—150	—
	Virginia Beach, Va.	NCZ	36 51 09*	75 58 34*	800	100	354—157	—
	Hog Island, Va.	NCZ	37 22 36	75 42 37	800	100	050—200	—
	Bethany Beach, Del.	NSD	38 32 45	75 03 22	800	100	010—200	—
	Cape Henlopen, Del.	NSD	38 47 34	7 05 26	800	100	000—200	—

† Temporarily closed.

* Position approximate.

Country.	W/T Station.	Call Signal	Latitude N.	Longitude W.	Wave-length (metres)	Range (miles)	Arc of Calibration (true)	Additional Details.
UNITED STATES (Atlantic Coast)— <i>continued</i>	Cape May, N.J.	NSD	38 55 53	74 54 35	800	100	Degs. 040—235	This station was temporarily closed from September, 1924, owing to a break in the cable connection between Cape May and Cape Henlopen.
	Manasquan, N. J.	NJY	40 07 05	74 01 58	800	—	010—190	
	Sandy Hook, N.J.	NJY	40 27 54	73 59 50	800	100	000—170	Station closed from November, 1924, for indefinite period owing to fire.
	Fire Island, L.I.	NJY	40 38 00	73 13 01	800	100	083—262	
	Amagansett, L.I.	NBM	40 58 10	72 07 27	800	100	070—230	
	Surfside (Nantucket (Mass.))	NBS	41 14 38	70 05 53	800	100	345—275	
	Price's Neck, R.I.	NGO	41 27 06	71 20 15	800	100	080—270	
	North Truro, Mass.	NAE	42 02 23	70 03 37	800	100	210—150	
	Fourth Cliff, Mass.	NWM	42 09 40*	70 42 22*	800	100	330—135	
	Deer Island, Mass.	NWM	42 21 15	70 57 30	800	100	015—150	
	Thatcher's Island, Mass.	NWM	42 38 08	70 34 47	800	100	060—220	
	Cape Elizabeth (Portland), Me.	NAB	43 33 59*	70 11 59*	800	100	050—210	
	Bar Harbour, Me.	NQC	44 18 49	68 11 40	800	100	070—235	
	South Pass, La	NBX	29 00 50*	89 09 33*	800	—	060—240	
UNITED STATES (Gulf Coast)								
UNITED STATES (Great Lakes)	† Detour Point, Mich.	NZU	45 57 19	83 54 54	800	100	080—260	
	†† Grand Marais	NZT	46 40 29	85 58 26	800	100	270—075	
	†† Whitefish Point, Mich.	NZT	46 46 19	84 57 22	800	150	275—180	
	† Eagle Harbour, Mich.	NUG	47 27 53	88 08 43	800	150	263—070	

* Position approximate.

† These stations are connected by land line and operate as a group.

†† These stations give continuous service during the season of navigation.

REGULATIONS FOR D.F. STATIONS IN THE U.S.A.

The U.S. Naval Communication Service will furnish D.F. bearings to mariners of all vessels equipped with wireless transmitters.

While the use of these bearings should not lead a mariner to neglect other precautions, such as the use of the lead, etc., during a fog, these bearings will greatly reduce the dangers to navigation for mariners who are compelled for any reason to proceed during foggy or misty weather.

The D.F. stations are provided primarily to assist the mariner in closing the land during fog or poor visibility, but they may be also used to obtain the positions of vessels at sea up to about 150 miles, when for any reason positions cannot be obtained by other means.

The maximum distance for which bearings from these stations are accurate is 150 miles. But accurate positions cannot be plotted when more than 50 miles from the station on Mercator charts for the Mercator projection introduces a distortion of the true bearing. Charts based on the Gnomonic projection are essential to plot correctly long distance bearings, but if not available, the methods described in the article

“Fixed Position by Wireless Directional Bearings” should be employed.

United States D.F. Stations are divided into two classes:

(a) Single stations, operating independently and furnishing a single bearing: These stations are located with the view of giving service to ships at a distance of not over 150 miles from the station.

(b) Harbour entrance groups: All stations in harbour entrance groups are connected to and controlled by the Control Station; all stations of the group take bearings simultaneously, and these bearings are transmitted to the ship requesting them by the Control Station. The purpose of these stations is to lead mariners to the light-vessels off harbour entrances.

Where only one D.F. station is available the mariner may fix his position by two or more bearings from the station with the distance run between, or may use the bearing as a line of position, or as a danger bearing. Or the bearing may be crossed with a line of position obtained from an observation of an astronomical body to establish a fix.

Wavelengths.—All independent and group D.F. stations in the United States keep watch on

800 metres. Only this wave should be used to call and work with these stations.

Calling a D.F. Station.—To obtain a bearing from independent stations, call the station from which the bearing is desired in the usual manner and request bearings by means of the conventional signal given below. Simultaneous bearings from two or more stations can be obtained by making the call include the other stations desired.

To obtain bearings from harbour entrance stations, carry out the procedure previously given. The Control Station only will answer.

Watchkeeping.—In clear weather the stations^s will not listen-out on the 800 metres wave during the first ten minutes of each hour, as during that time they are employed in practice and instruction; but should a station chance to hear a call for a bearing during this period, the requested bearing will be given. Otherwise all requests for bearings should be confined to the remaining 50 minutes of the hour. During inclement weather, fog, mist, rain, sleet or snow, the stations will listen-out continuously on the 800 metres wave for the purpose of furnishing bearings.

Mariners are urged to use the stations, both during clear and foul weather, and report the results obtained to the Hydrographic Office, Washington, D.C., U.S.A.

Conventional signals.—The following signals will be used :—

Signal.	Meaning.
QTE ?	What is my true bearing ?
QTE	Your true bearing is....degrees from....D.F. station.

Where two or more D.F. stations have the same call signal it indicates that they are connected by telegraph to and under the control of a central control station, the call signal being the call of the central control station. When a request for bearings is made the central control station invariably answers with a bearing from each of the D.F. stations under its control.

(a) To obtain bearings, the D.F. station should be called in the usual manner, and the call followed by the signal "QTE ?" meaning "What is my true bearing ?" This request will be answered by the D.F. station or control station, and when ready to observe the bearing it will send the signal "K," indicating to the ship to commence "testing"; i.e., repeating its distinguishing signal for a period of 50 seconds. The signal should be made slowly with the dashes considerably prolonged.

(b) The testing should be made on 800 metres, upon the completion of which the ship should await reply from the D.F. station.

(c) The D.F. station or control station will then reply, repeating the abbreviation "QTE" ("Your bearing from.....was....degrees,") followed by the bearing in degrees given by a group of three figures, 000 to 359, indicating the true bearing in degrees of the ship station from the D.F. station, and then the time group giving the time of observations in local standard time. In the case of more than one D.F. station connected by land line only, the station originally called will answer. This station will combine all the bearings taken by itself and associated stations into one message, which gives each bearing observed immediately after the name of the station making the observation.

All D.F. stations transmit on 800 metres.

EXAMPLE.

A ship (call letters KVA) desires to obtain bearings from the Delaware Bay entrance group (call letters NSD). The following procedure is used :—

```

- - - - - NSD NSD NSD - - - - - KVA
KVA KVA - - - - - QTE - - - - - AR
- - - - - KVA - - - - - NSD K.
- - - - - NSD - - - - - KVA
- - - - - QTE - - - - - KVA KVA
KVA (making call letters KVA for 50 seconds,
prolonging the dashes) - - - - - KVA AR
- - - - - KVA - - - - - NSD
- - - - - QTE
Cape May 120 Cape Henlopen 110 Bethany
Beach 085 at 0126 - - - - - NSD AR
- - - - - NSD - - - - - KVA
- - - - - 120 110 085 at 0126 - - - - -
AR
- - - - - KVA - - - - - NSD R
- - - - - NSD

```

This method is the only authorised procedure for calling, answering and testing, and should be followed exactly. Such signals as MO — V — and other test signals are not authorised for direction finding. The testing period of 50 seconds should not be exceeded.

Mariners who do not follow the prescribed procedure exactly occasion delay to themselves in obtaining bearings and to other mariners who may be waiting for an opportunity to use the D.F. stations.

The following information is furnished by the Director of the U.S. Naval Communication Service :—

"The reliance that can be placed in bearings furnished by shore D.F. stations will be governed by the following conditions :—

(a) When two sets of bearings are received which do not agree, a third set should immediately be requested.

(b) In thick weather bearings should be requested at least every half hour.

(c) Bearings that pass over intervening land or that are tangent to the shore line are not as reliable as those that have a clear sweep over the sea.

(d) Navigators receiving a set of bearings should immediately investigate the approximate fix indicated, and determine whether or not they are being furnished with bearings from the stations that should be most reliable.

(e) When the position of the ship as indicated by the D.F. bearing differs materially from the position by dead reckoning, a second set of D.F. bearings should be requested in order to check the first D.F. position."

When a single bearing is furnished there is a possibility of an error of approximately 180°, as the operator at the D.F. station cannot always determine on which side of his station the vessel lies. Certain stations, particularly those on islands or extending capes, are equipped to transmit two corrected true bearings for any observation. Such bearings, when furnished vessels, may differ considerably from 180° from each other, and whichever bearing is suitable should be used. Mariners should, therefore

never attempt to correct a bearing furnished by a station, by the application of the 180° correction, as such correction does not take into account the deviation at the D.F. station, which may be of different sign and unequal amount in opposite directions. The error introduced by the use of 180° correction may amount to as much as 030° . Vessels receiving bearings requiring approximately 180° correction should request the reciprocal bearing from the D.F. station, in case the same is not sent.

Subject to the foregoing, bearings should be accurate within 002° of arc. When bearings from three or more stations are not over 002° of arc in error, but do not meet at a fixed point, the geometrical centre of the triangle formed by the bearings can generally be taken as the approximate position of the vessel.

Cautionary Note.—The Director, U.S. Naval Communications, states that considerable difficulty is being experienced with merchant ships asking for D.F. bearings on very broad tunes, and that "bearings obtained by D.F. should be accurate within 002° , provided that the transmitting equipment on board vessels is tuned sharply to 800 metres. W/T operators

are cautioned to use sufficiently wide coupling to obtain low decrement. If W/T transmitters are not tuned sharply it is difficult to obtain bearings that are sufficiently accurate for navigational purposes."

Masters of vessels are advised to use the D.F. stations frequently, particularly in clear weather, and when the vessel's position is definitely fixed, in order that the degree of accuracy and dependability of the W/T compass may be established.

Instructions have been issued that United States D.F. stations are not to give bearings outside the calibrated sectors, except in cases of emergency.

Note.—While the U.S. Navy Department states that at the present time D.F. bearings have reached a high degree of accuracy, it must be understood that the U.S. Government incur no liability for any consequences resulting from any inaccuracy in the taking or transmission of D.F. bearings. These bearings are provided free of charge, as aids to navigation, to be used at the discretion of the master of the vessel.

AVIATION SECTION

Civil Flying 1924

Direction Finding

Aviation Stations

CIVIL FLYING, 1924.

By DUNCAN SINCLAIR.

TWO important changes have occurred since the last edition of this section of the "Year Book."

The amalgamation of the former British air operating companies, Messrs. Handley Page, Ltd., Messrs. Instone Air Line, Ltd., and Messrs. Daimler Airways, Ltd., into "Imperial Airways, Ltd.," has placed the industry on a firmer footing, and brought British development more into line with that of other countries. The comparison between this British company, of such Imperial interest, and between the Air Union of France, the S.A.B.E.N.A. of Belgium and the K.L.M. of Holland, is now an exact one.

The airship has again come into operation. During the summer of 1921 extensive trials took place with two rigid ships, the R 33 and R 36, with a view to preliminary investigation into the possibilities of commercial operation on routes of particular interest and importance to the Empire. The scheme involved purely Government operation at that stage, and a lot of work was done by Royal Air Force personnel—the residue of the airship service of the war—aided by specially engaged civil personnel. Some extensive flights over the British Isles and France and Belgium were performed, and much valuable information obtained, particularly relating to wireless.

At the height of this programme, however, the operations were ceased for various considerations and reasons, and, thereafter, until the latter part of 1924, the ships were deflated and stored. Much was heard in the Press, in the meanwhile, of several schemes for airships, notably that put forward by Commander Burney, and ultimately a workable basis was reached which is about to mature. It is anticipated that in February, 1925, R.33 will be again in the air and engaged upon airworthiness trials. In 1926 she should be ready to carry out a test flight to Egypt, followed by a test flight by her sister ship, R.36, to India during the following year. By that time the new ship, R.101, should be ready to take the air, and able to inaugurate the first British passenger and freight airship service to Australia, *via* the East. The possibilities from the radio-engineering standpoint are very wide ones, and will require to cover the fields of telephony, long distance telegraphy and air navigation by direction-finding apparatus most probably carried on the ships themselves. This latter question, however, presents no inconsiderable difficulties, and there is room for much research work in order that a reliable and exact method of operation may be produced. It is not insurmountable.

During this same period of twelve months Imperial Airways have somewhat reorganised the British airways, and though still further changes are contemplated, the routes to-day are :—

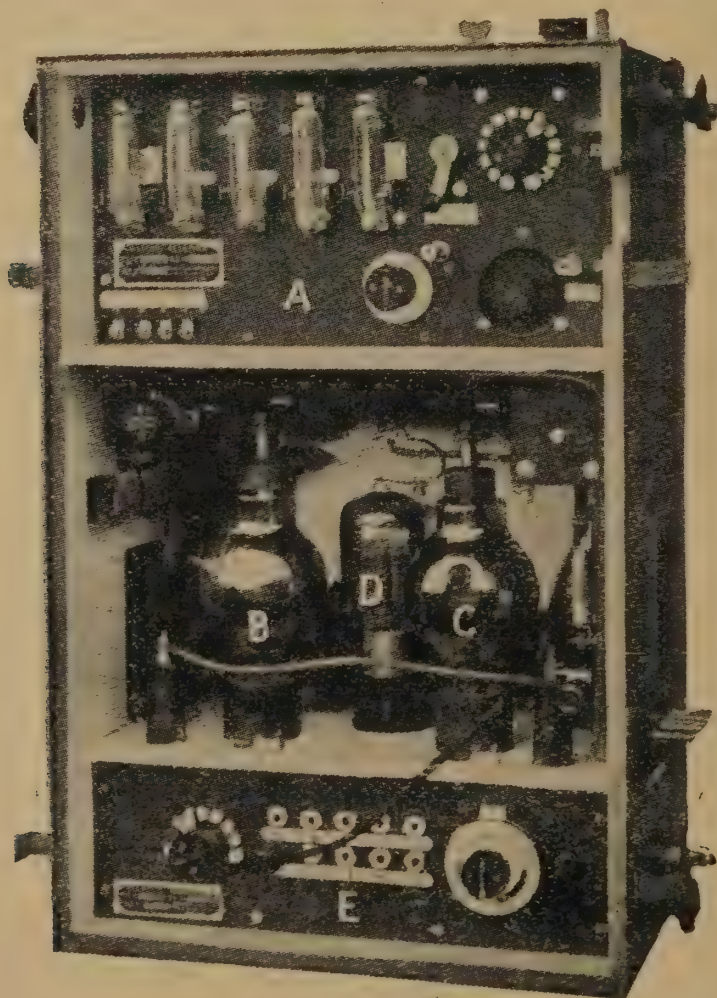
- (1) London—Paris—Basle—Zurich.
- (2) London—Brussels—Cologne.
- (3) London—Rotterdam—Hanover—Berlin.
- (4) Southampton—Guernsey.

all of which are on a regular working basis.

A new company, which operated during 1924, recommences again in March this year, and will fly between North-Western England (probably Carlisle) and Belfast, *via* Stranraer. Whereas Imperial Airways aircraft normally carry wireless apparatus, the new company, Northern Air Lines, so far do not seem to give any indication of so doing. In view of the very great use made daily of wireless by the former company, it will be most

interesting to see how long and how successfully the latter can fly without it, remembering that there is really no method of checking and controlling an aircraft's flight unless wireless is carried. The writer has frequently discussed the utility of wireless on aircraft with Captain F. L. Barnard, and other pilots whose names are also well known, whose opinions are invaluable and whose experience cannot be equalled, and the feeling is that it is indispensable. In some cases it is felt that to leave the ground without wireless would be at least a grave fault.

It will be remembered that last year a description was given of the aircraft transmitter and receiver in standard use. This instrument was designed and constructed by the Marconi Wireless Telegraph Company specially to meet the requirements of an air line in Europe, and was known as the A.D.2. It was stated that a new and improved design of instrument was nearing completion, and would be known as the A.D.6. In view of the very marked success which had generally attended the use of the A.D.2, the advent of its replacement was viewed by many with mixed feelings of anticipation and apprehension. The first of the new sets was installed in an Imperial machine early in December, 1924, and at once all doubts were dispelled. The performance is at least equal, and although at this early stage it is probably both unwise and unnecessary to pass judgment



Aircraft Transmitter and Receiver. Type A.D.6.

- A. Amplifying Detector and Receiver
Tuning Unit.
B. Oscillating Valve.*

- C. Modulating Valve.
D. Sub-Modulating Valve.
E. Tuning Unit of Transmitter.*

upon the A.D.6, it would appear that there is every indication of a further advance having definitely been made in the science of aircraft signalling.

The same reason that prompted a description of the A.D.2 prompts a description of the A.D.6.

The A.D.6 Aircraft Set has been designed particularly for commercial services when a wide band of wavelengths is required, and for communication by telegraphy or telephony with the aerodrome ground stations up to distances of 100 to 200 miles. The set is suitable for the transmission and reception of continuous wave, tonic-train and telephone messages. Where space and personnel permit, the apparatus can be installed in such a position that the operator has access to and full control over all adjustments, and can therefore take full advantage of the wave range and flexibility of the installation. Where space is limited, as on the smaller types of aircraft, and where no special operator is carried, the set can be mounted in any convenient part of the machine, the remote control unit enabling the pilot to operate the set himself in a very easy manner.

Many improvements, both mechanical and electrical, have been introduced into the design of the A.D.6 as a result of the accumulated experience of the working of the earlier types of aircraft sets. Perhaps the most important of these improvements are :—

- (1) A considerable increase in the waverange of both transmitter and receiver.
- (2) Increased control of the carrier wave on telephony, giving better modulation and an increased range for telephone communication.
- (3) Mechanical operation by "Bowden" cable of the change-over switches and tuning adjustments through the remote control unit which takes the place of the electrical connections hitherto employed, thereby avoiding the many technical disadvantages inherent to the latter system.
- (4) The elimination of the high tension receiver anode battery by utilising some of the current generated by the dynamo for this purpose.
- (5) A substantial increase in the power to the anode of the oscillating valve.

The standard equipment comprises :—

- (1) Instrument box, containing transmitter and receiver units.
- (2) Remote control unit.
- (3) Microphone.
- (4) Telephone headgear.
- (5) Telegraph unit, comprising key, buzzer and switch.
- (6) Generator and air screw.
- (7) Accumulator, floating, 6-volt 25 ampere-hour.
- (8) Aerial winch, aerial and weight.
- (9) Fairlead, cables, etc., etc.

The waverange obtainable depends to a certain extent on the electrical capacity of the machine to which the set is fitted, which, in turn, depends largely on the size of the aircraft. When installed on a machine of normal size, both the transmitter and receiver are adjustable to any wavelength between the limits 400 metres-1,200 metres. On very small machines, the waverange may be reduced to 350 metres-900 metres.

The range of a transmitter depends upon so many variable factors that any figures given must necessarily be subject to reservations. It is, however, interesting to give some indication of the performance in this respect which may be expected from this apparatus. Assuming normal atmospheric

conditions and modern receiving apparatus, the range from aircraft to ground with good readable signals is approximately :—

For telephony	100-150 miles
Tonic train telegraphy	120-180 miles
For continuous wave telegraphy	200 miles

The overall dimensions and approximate weights of the various components comprising the complete A.D.6 set are as follows :—

	<i>Dimensions.</i>	<i>Weights.</i>
Transmitter and Receiver	$14\frac{3}{4} \times 21'' \times 8\frac{1}{8}''$ 37·5 cms. 53·4 cms. 20·7 cms.	30 lbs. 0 ozs. 13·6 kilos.
Microphones and Telephones		2 lbs. 0 ozs. 0·9 kilo.
Telegraph Unit	$7\frac{1}{2}'' \times 4\frac{3}{4}'' \times 5\frac{1}{8}''$ 19 cms. 12 cms. 13 cms.	4 lbs. 5 ozs. 1·9 kilos.
Generator and Leads	$17'' \times 14''$ 43 cms. 35·5 cms.	26 lbs. 11 ozs. 11·8 kilos.
Accumulator	$7'' \times 4\frac{3}{4}'' \times 4''$ 17·8 cms. 12 cms. 10 cms.	10 lbs. 12 ozs. 4·85 kilos.
Aerial Winch, Aerial and Weight		7 lbs. 8 ozs. 3·4 kilos.
Fairlead		1 lb. 0 ozs. 0·45 kilos.
Aerial Ammeter		8 ozs. 0·225 kilo.
Bowden Control Operating Gear		3 lbs. 12 ozs. 1·7 kilos.
1 Set Suspension Brackets and Elastic		2 lbs. 8 ozs. 1·13 kilos.
Aerial and Earth Connecting Leads		1 lb. 4 ozs. 0·57 kilo.
Total Weight		90 lbs. 4 ozs. 42 kilos.

A brief description of the more important features of the set is also of interest. The instrument box contains the essential components of both transmitter and receiver. It is fitted externally with strong lugs to which the rubber shock absorber suspensions can be conveniently attached. In spite of the extreme compactness of the apparatus, all components are readily accessible and can be removed by any qualified mechanic for examination or repair. A simplified diagram of connections is shown opposite :—

The transmitting system comprises :—

- (1) An aerial tuning inductance with tappings for varying the wavelength in steps of about 80 metres and a variometer for obtaining intermediate values of wavelength.
- (2) An oscillation valve for energising the aerial circuit coupled to the aerial by means of a grid variable reaction coil and an anode tap connection on the aerial tuning inductance. A useful provision is the side-tone circuit which enables the operator to overhear his own speech and to be confident that the speech is being correctly transmitted.
- (3) A modulating system consisting of a control valve and a sub-control valve connected in cascade across the generator and speech choke.

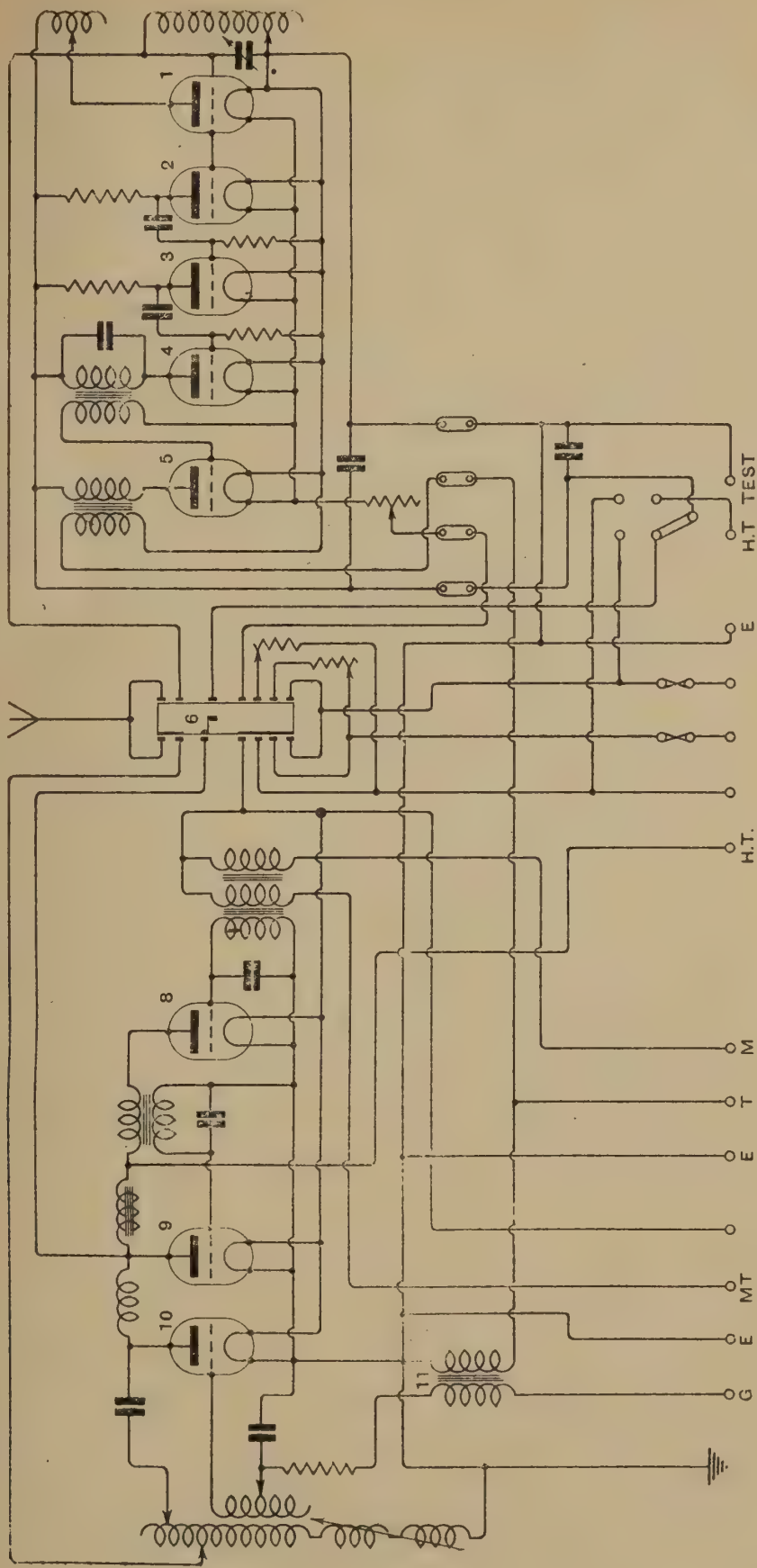


Diagram of Connections.

Type A.D. 6. Transmitter and Receiver.

The receiver system comprises :—

- (4) A tuner for high-frequency selection.
- (5) A five-valve amplifier. One valve is used for reaction, two for high frequency amplification with resistance capacity coupling, one for rectification, and one for low frequency amplification. Self-heterodyne reception of continuous wave signals is provided for by the reaction valve of the amplifier.

The anode circuits of the receiving valves are fed from the generator, the high tension voltage being reduced to about 80 volts by the insertion of a large resistance in the high tension field of the generator.

The remote control unit is a simple mechanical device with four levers, which operate, through Bowden cables, the—

- (1) Change over (send-receive) switch.
- (2) Aerial tuning condenser.
- (3) Receiver valve filament resistance.
- (4) Receiver reaction coupling.

This unit is designed in a conveniently compact form for mounting within easy reach of the pilot, and can be readily detached if required.

The microphone is of the standard design for aircraft work, and is protected against engine noise, while the head telephone receivers are of the low resistance pattern (120 ohms), and plug directly into the instrument box, into a socket on an extension lead, or into sockets provided in the telegraph unit.

The telegraph unit consists of a morse hand key, a three-way switch and a buzzer. The switch enables the pilot or operator to change at will to continuous wave, tonic train or telephony. The buzzer is a considerably interesting piece of work, and is of improved design, giving an adjustable note of great constancy over quite a wide scale.

The generator employed has a total output of about 200 watts, *i.e.*, 100 milliamps at 1,500 volts, plus 6 amperes at 7 volts. It can be run as a motor generator, consuming approximately 18 amperes at 12 volts. The accumulator battery is a 6 volt 25 ampere-hour group, and floats across the low tension windings of the generator, thereby giving a constant steady feed to the filaments of the receiving and transmitting valves. The supply is controlled by a series resistance, and the supply is so ordered that during flight the accumulator is maintained practically fully charged.

The following table indicates the number, types and electrical characteristics of the valves used on the set.

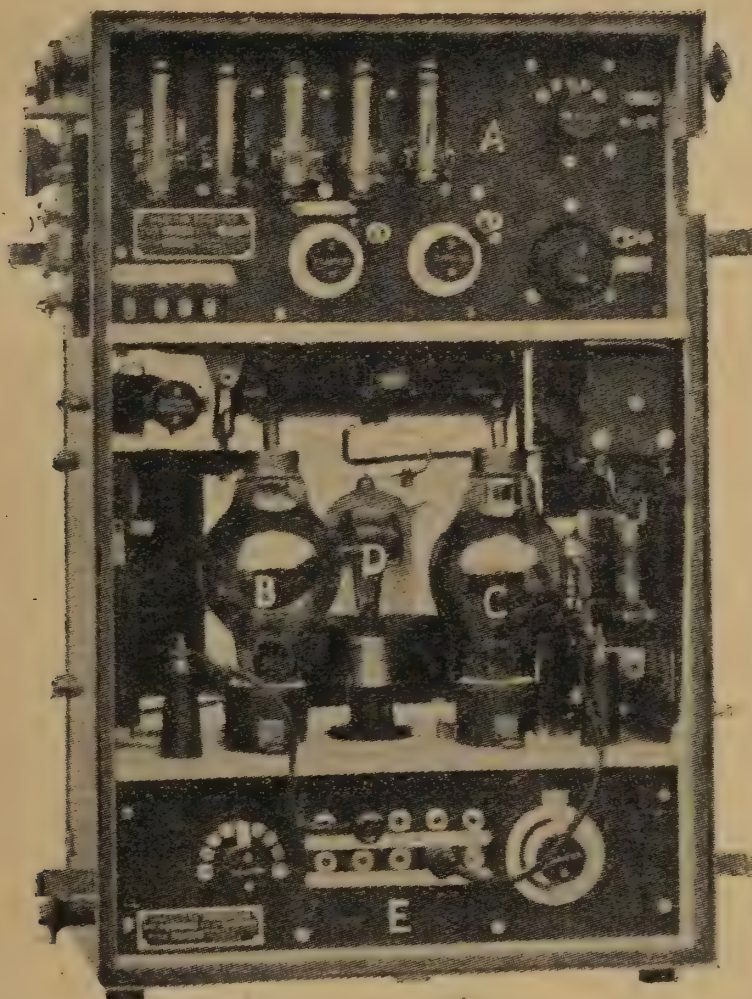
Type.	No.	Used on.	Filament Volts.	Total Filament Current.	Anode Voltage.
				Amperes.	
M.T. 3F ..	2	Transmitter	6.0	4.6	1,500
M.T. 5 ..	1	Transmitter	6.0	2.0	1,500
V 24 ..	4	Receiver	5.0	3.75	80
QX ..	1	Receiver	5.0		

A modified type, which differs very slightly from the A.D.6, is the A.D.6a.

These sets are used not only on Imperial Airways land aircraft, that is, those operating between London and the various continental centres, but

also on their Southampton—Channel Isles flying-boat service. At the present time, however, these two services are controlled on different wave-lengths, in order to give the fullest benefits to each group. The continental services work on 900 metres, while the Channel Isles service works on 870 metres.

There are many operational problems in a flying-boat service which have their bearing on the radio work, and which need careful treatment. An 80 miles over water flight with a water "take off" and "landing" necessitates the very greatest care in fitting and maintenance, more especially when one realises that in the event of involuntary descents the wireless plant



Aircraft Transmitter and Receiver, Type A.D.6a.

- | | |
|---|---------------------------------------|
| <i>A. Amplifying Detector and Receiver Tuning Unit.</i> | <i>C. Modulating Valve.</i> |
| <i>B. Oscillating Valve.</i> | <i>D. Sub-Modulating Valve.</i> |
| | <i>E. Tuning Unit of Transmitter.</i> |

is the only means of requesting assistance. Moreover, wireless navigation on long sea journeys is a very pressing matter of importance, as lengthy periods frequently elapse between definite views of known points. This navigation is naturally a question of direction finding, and though, by close co-operation with pilots and by very careful consideration of every error as it arises from time to time, it has been possible to reduce troubles to what may be said to amount to a negligible quantity, yet occasions can arise when the existing system becomes helpless. They do not often arise. Sometimes

many months may pass with no fault. But there is, nevertheless, the possibility of error. No one can control, as yet, fog, cloud, or dawn and dusk; yet while we use the Bellini-Tosi system in its present form each of these phenomena can cause an inexplicable "wandering" of the bearings obtained. What is required is either an improvement of the system of taking bearings on the ground, or a system of taking bearings from aircraft in flight on known ground stations, with a high degree of accuracy. The second method has the appearance of being the cheaper, and, if as accurate, therefore the better—especially over very long flights. In fact, for long flights it does not seem to be a commercial proposition to work against the large initial outlay, and high recurring annual charges, necessary to equip ground direction finding stations every two, or even three hundred miles, along an airway. The cost of installation of some direction finding system in the aircraft themselves is bound to be very much less in comparison, and, moreover, existing wireless stations either along or near the route can be used as radio-beacons. Further, bearings can be taken at any time during flight at the will of the pilot or navigator, in whose hands is then vested the sole responsibility for the conduct of the journey. The principle of divided responsibility between the man in the air and the man on the ground seems obviously a wrong one, and bound to lapse sooner or later. It cannot, in any case, ever hold over medium distance or long flights. The aircraft of the future is bound to become more and more a self-contained and self-responsible unit, in the same way that it is bound to be required to handle private traffic and cater for a "broadcast" audience through the medium of its wireless equipment. All these matters have to be realised very thoroughly and a careful watch kept upon them as development progresses. The air passenger of to-morrow will expect to be able to telegraph or even telephone to his friends and agents on ground, and he will expect his broadcast entertainment also. Stretching imagination even further, he is more than likely to expect his moving picture entertainment by "television." There are people who would scoff at these ideas. I wonder if they will scoff at them ten years hence! Let them remember the parable of the steam train and the stage coach!! Let them remember wireless itself!!!

These matters and others similar must engage the ever increasing attention of the aircraft radio-engineer. Does the solution lie in short wavelengths and some revolutionary change, affecting everything wireless, depending on the use of short wavelengths? It seems more than likely. We stand to-day on the very outer edge of the threshold of an unknown domain, unexplored, unparalleled. We are like a man groping in a dense fog. We understand that we can produce certain phenomena if we perform certain actions, but does anyone in the world know the reason for these phenomena? Explanations and theories may be put forward, but they can be little more than the very merest surmise when we do not understand in the very least the medium in which we propagate our radiations.

Will the very short fixed aerial replace the 200-300 feet of wire now used on an aeroplane? Or will any aerial at all be needed? Progress is becoming so rapid that it is difficult to grasp all the possibilities.

Meanwhile the practical man and the theoretical man working with aircraft wireless must concentrate on doing the utmost that they are able to do to assist in diminishing the worries of the man who flies his passengers from place to place—the man who is the pioneer in the world's future everyday transport.

Some of these points are anticipated in the "Notice to Airmen" recently issued by the Air Ministry, viz., No. 61 of 1924. It is of great interest actually, and is as follows:—

CONDITIONS UNDER WHICH AIRCRAFT ARE REQUIRED TO CARRY WIRELESS APPARATUS AND A LICENSED WIRELESS OPERATOR, AND CONDITIONS AS TO THE USE OF WIRELESS APPARATUS.

1. With reference to Section V, para. 41, of the Air Navigation Directions 1922 (A.N.D. 3) (as amended by the Air Navigation Directions, 1924; A.N.D. 3C), which prescribes the instruments to be carried by British aircraft registered in Great Britain and Northern Ireland, it has been decided that :—

- (a) All aircraft capable of carrying 10 or more persons, including the crew, shall be equipped with wireless apparatus.
- (b) All aircraft equipped with wireless apparatus shall, when used for public transport and when flying 100 miles, or 15 miles over sea, carry a licensed operator and maintain a continuous wireless service during flight. In the case of aircraft capable of carrying 10 or more passengers the licensed operator shall not be the pilot.

It is intended shortly to take steps to give legal effect to the foregoing decisions, and in the meanwhile it is considered advisable that all owners of aircraft should act in accordance therewith without delay.

2. It is intended at a later date in accordance with international agreement, further to amend the conditions under which aircraft are required to carry wireless apparatus and a licensed wireless operator.

Aircraft used in public transport and when flying 100 miles, or 15 miles over sea, will, as regards the carriage and employment of wireless apparatus, be divided into two categories :—

- (A) Those capable of carrying less than 10 persons including the crew.
- (B) Those capable of carrying 10 or more passengers including the crew.

Aircraft belonging to category A will be required to be fitted with wireless apparatus (telegraph or telephone), and a licensed operator, who may be the pilot, shall be carried.

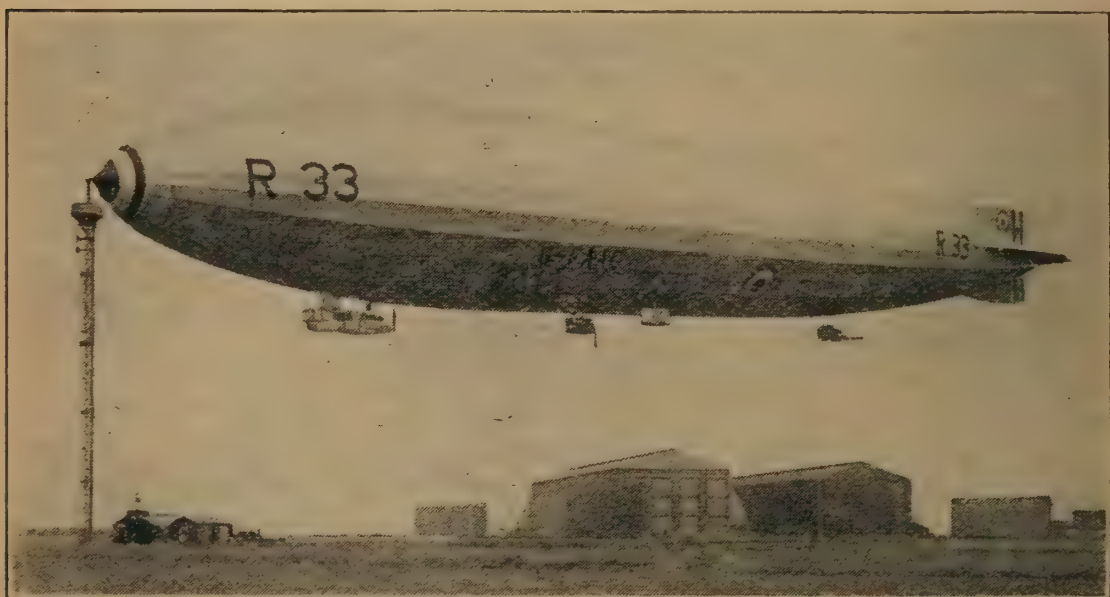
Aircraft belonging to category B will be required to use only telegraphy for normal communications, a licensed operator shall be carried, and it will be compulsory for the radio-telegraphy apparatus to be worked by a licensed operator other than the pilot. The use of radio-telephony will be confined to cases of emergency.

Summed up briefly—there is no need to attempt explanation since the notice is explicit—this means that all aircraft of importance must be equipped with radio-apparatus and that the advent of the air-going radio-telegraphist is at hand. What more could be said as to the trend of events, or of the state of flying in this part of the Empire ?

Yet another profession opens before the youngster leaving school or college, holding an operating licence and being physically fit ; and one with, it seems probable, an enormous future for the right kind of fellow. It is not world-wide to-day. It is confined to comparatively few aircraft, but once that conservative body, the general public, makes up its mind to fly it will grow by leaps and bounds. That this will happen is to be seen in the single fact that there are many people who now—only five years after the real inception of commercial aviation—travel habitually by air in preference to other methods. And many, many more will do the same as the routes extend, and as the public realises the lack of discomfort and danger in flying, the great saving of time, and the actual comparative cheapness as against boat and train. It is true that a serious accident has occurred just before Christmas involving the sad loss of eight lives, and that, it could be said,

undue Press publicity was given to it—possibly because an air accident is so rare. But when one considers the percentage of fatalities and injuries of air travel as against those of ground and sea, the comparison is extremely in favour of the air. Greater danger, personal insecurity, imminent injury—all these in air travel are really myths. Or else this article had never been written.

The problems of efficient radio-communication for airships differ somewhat from those of the heavier-than-air-craft. In certain senses they are much easier problems. One is not compelled to consider so much questions of weight or of space occupied. In the aeroplane, or flying-boat, there is a comparatively low limit of maximum load, and the ratio of the weight of a wireless set to this load is much higher than that of the set to the load carried by the big rigid airship. Something in the region of 1,000 lbs. can be set aside for wireless plant on an airship of the size of R.33 or R.36. And this is most fortunate because the task that is given the radio engineer requires more, by virtue of the much greater range required of the ship to quote one instance, and of the greater time it remains in the air, to give another. One is not compelled to rely so much for power upon a wind-driven generator



R33 riding at Pulham mooring mast.

fixed outside the aircraft in the propeller slip-stream; for a generator belt driven from a main engine, can be placed in each of the engine cars, and each can be used in turn. This gives a system of supply which is, to all intents and purposes, above breakdown.

In the case of the heavier-than-air machine operating a given airway, it is found, in practice, that an intermediate landing ground, fitted with radio-telephony, is necessary at distances approximating to every hundred miles between termini. This is due to the inherent qualities of the aircraft, and the wireless organisation is modelled accordingly. Short distance radio-telephony, of the ranges within the limits given by the A.D.6, suffice for air-ground communication for the smaller machines, and telegraphy of low power will suffice for the larger. Telegraphic communication of low power between aerodromes is all that is needed to-day for the passage of the messages at present authorised internationally, *i.e.*, those of security and regularity affecting the services.

For the airship it is different. There the average "jump" is anything between 1,000 and 2,000 miles. Telegraphy is essential as the main method of communication during flight, both because it is more exact, and because, for a given range, less input energy is needed for radiotelegraphic signalling than for radiotelephony.

In order to land an airship it is necessary to know something of the ground temperature, surface wind conditions, local mists, and so on; and therefore a very rapid means of communication at very short range—say, for example, the last 10 or 15 miles of a flight prior to landing at the mooring mast—is essential. Instructions concerning the actual process of landing, and a dozen other matters, must be passed between ship and mast before she is secured. Here is the opportunity for radiotelephony.

Her navigation out in the open air, apart from the usual methods of astronomical and other work, will depend, as far as the radio engineer is concerned, on the suitability of the various methods of direction finding on board. The exact determination of this question is yet to be made. To a large extent the various existing ground direction finding stations will be used, but there seems to be little doubt that the trend of development will lead finally to wireless direction finding on board the airship, as it must also lead to the same end on the other forms of aircraft.

The future aircraft wireless operator, therefore, will have to be of a high standard. Whether his work lies on the aeroplane, the flying-boat or the airship, he will be called upon to fill a more responsible position, perhaps, than that of any other class of operator. His abilities for accuracy and rapidity must be perfect ones. He must be able to speak at least one other foreign language quite well, and to operate at not less than 20 words per minutes in practically every form of commercial wireless procedure. He must be thoroughly cognisant of the various international regulations with which he will come into touch. He must be able to speak clearly, distinctly and accurately. And above all he must be absolutely and entirely up-to-date in radiotelephony, direction finding and continuous wave telegraphy.

The syllabus for the examination of operators for the Postmaster-General's licence to operate radio apparatus in aircraft will doubtless be available shortly, and perhaps the first batch of candidates may be examined shortly also.

It is to be hoped that whoever they may be and from whatever circumstances in life they come, they approach their task with a full sense of the responsibility that will be theirs, and with a determination to do their work to the utmost of their ability. They will be the pioneers of their calling, and upon them rests the success or the failure of everything.

It is not an exaggeration to remark that in commercial aviation we lead the world to-day. An American lady once remarked at Croydon, after having flown from Paris in fog and generally bad weather conditions, "You folks surely know how to fly." There is the reputation that has been established. There is the spirit which the wireless air operator has to maintain. Simply because wireless in the air—and the best brand of wireless too—is about the first essential to the satisfactory operation of an airway.

REGULATIONS & PROCEDURE —GENERAL.

I.—RADIOTELEPHONY: ORGANISATION AND PROCEDURE

SECTION I.—GENERAL REMARKS.

1. Radiotelephony equipment in aircraft, operated in conjunction with the system of ground stations, affords an efficient means of controlling air traffic. It enables pilots to report progress *en route*, to obtain meteorological information for any point of their journey, to obtain navigational aid when flying at night or in adverse weather conditions, and, in cases of distress, is an important factor in obtaining assistance. It has the additional utility of enabling inter-communication between aircraft in flight to be effected.

2. The Postmaster-General's Certificate for Radiotelephony must be held by every person operating R/T installations in civil aircraft, which Certificate will be granted after due examination. Similarly all aircraft carrying wireless apparatus must be licensed by the Postmaster-General for that purpose.

3. Conversation by radiotelephony must be as brief as possible, and for this reason it is desirable that pilots, before leaving the ground, should be in possession of the latest information available at the time of departure. The precaution of "listening-in" must be taken by every aircraft operator prior to making an initial call, in order to ensure that the station called is not already working.

SECTION II.—ORGANISATION.

1. *R/T Ground Stations.*—The radiotelephony stations available for aircraft communication, classified by their respective countries, are shown in Part III of this Notice.

2. *Language.*—When working with continental R/T stations, the language used should be that employed by the ground station worked, except in Holland where English will be used.

3. *Scope of British Stations.*—The London Terminal Aerodrome station will maintain communication with aircraft, both inward and outward bound, as far as the Continental coast, the Lympne station standing by to relay as and when necessary. In this connection it should be observed that the Continental stations also will maintain communication with aircraft, bound in each direction, as far as the English coast; thus affording the advantage to the aircraft of being in touch with the air route stations on both sides. Care must be taken, however, when making position reports, to ensure that such reports are received by both the Croydon station and the appropriate foreign station.

With the exception mentioned above, aircraft will normally communicate with the nearest ground station.

4. *Wavelength.*—The international wave band allocated exclusively for aircraft communication by either radiotelephony or radiotelegraphy is 850-950 metres. The normal wave at present used for such communication is 900 metres. Under certain circumstances, as hereafter shown, the wavelength of 600 metres may be used by aircraft for the transmission of distress signals.

5. *Call Signs.*—The R/T call sign of a ground station is the name of that station, while the international registration mark of an aircraft is also its W/T or R/T call sign.

6. *Emergency General Call Signs.*—In cases of emergency, commercial aircraft may call the nearest R.A.F. or Air Ministry civil aviation ground W/T station by using the call sign GEZ (any R.A.F. or Air Ministry civil aviation ground W/T station), and similarly any commercial ground station wishing to communicate with R.A.F. aircraft can do so by making use of the general call sign GEA (any R.A.F. aircraft). The W/T procedure to be used by commercial aircraft in this connection is shown in the subsection on Procedure. Equivalent call signs have been allocated by the French air authorities as shown:—

FNA .. Any French aircraft.

FNZ .. Any French ground W/T station.

SECTION III.—NATURE OF COMMUNICATIONS.

Communications to be assured by wireless stations (ground or aircraft) intended for air navigation must be confined to the transmission and reception only of messages necessary for ensuring the regularity of the aerial services and the safety of aircraft. (Messages dealing with the safety of aircraft will have priority). In this connection the deciding authority regarding the transmission of any message, not covered under any of the following headings, is the Civil Aviation Traffic Officer:—

1. *Distress Calls.*—The word MAYDAY will be used in making a distress call by R/T on the 900 metres wave, and its use will ensure immediate attention by all stations receiving it. A pilot making a forced landing at sea, when in communication with aircraft R/T ground stations, should make the call three times on the 900 metres wave, followed by as much information (concerning locality, nature of distress, etc.) as time allows. Upon receipt of the distress call the direction finding stations, situated at Croydon and Pulham, will at once take bearing of the aircraft concerned and will report the results to the traffic officer at Croydon, who will take all necessary steps to render immediate assistance, according to the pre-arranged scheme for such occurrences. During the time that Croydon and Pulham are taking such bearings, Lympne will concentrate on getting the whole message, it being observed that Croydon's primary object is to obtain a reliable bearing, an action which may involve the non-reception of portions of the signal.

NOTE.—In the case of an aircraft making a forced landing at sea when employed on special flights which take it out of range of aircraft ground R/T stations, the distress call, S.O.S., should be made on the 600 metres wave, the general ship distress wave. In this case the call should preferably be made on "interrupted continuous wave" transmission by Morse, but if no skilled telegraphist is carried the call may be made on the 600 metres wave by R/T.

2. *Navigational Aids.*—Aircraft in need of navigational assistance can obtain the following aids:—

(a) A position as plotted by bearings taken by two D/F stations.

(b) A bearing of the aircraft taken from a single D/F station.

It should be carefully observed that :—

- (i) All bearings given by D/F stations are true, and not magnetic.
- (ii) British D/F stations will not give "courses."

Full details of the radiotelephony routine for the D/F service are given in the D.F. sub-section.

3. Position Reports.

(a) Great Britain.—

Aircraft operating over British sectors of the recognised air routes will report when at the following places :—

London, Paris, Zurich, Brussels, Rotterdam and Berlin.

- (i) Biggin Hill } Both inward and out-
- (ii) English Coast } ward bound.

(b) France.

Aircraft operating over the French sector of the London-Paris route will report to Le Bourget when at :—

- (i) French Coast.
- (ii) Abbéville.
- (iii) Beauvais.

(c) Belgium.

Aircraft operating over the Belgian sector of the London-Brussels-Cologne route will report to Brussels when at :—

- (i) Continental Coast } Both inward and
- (ii) Alost } outward bound.
- (iii) St. Trond }

(d) Holland.

Aircraft operating over the Continental sector of the London-Amsterdam route will report at :—

- (i) Continental Coast } Both inward and
- (ii) Ostend } outward bound.
- (iii) Flushing }

When leaving either coast, aircraft will announce the intended point of their arrival on the opposite coast, and any change of course while over the Channel must be immediately notified.

N.B.—Should an aircraft be flying on a course other than that generally followed on any particular airway, position reports must be made from points equivalent on that course to the position reporting points of the airway.

4. Weather Reports.—

(a) Weather reports giving the latest information from stations on the cross-Channel air routes are available for communication to pilots of machines in flight, upon demand, and are drawn up in the following form :—

Time of Observation.	Place.	General Weather and Warnings.	Visi-bility.	Height of Lowest Cloud (feet).

(b) Places for which information is available are Biggin Hill, Lympne, Beachy Head, St. Inglevert, Abbeville, Beauvais, Compiègne, Le Bourget, Brussels, Ostend, Flushing, Rotterdam and Schiphol. Under certain bad weather conditions, reports for Grain, Deal and North Foreland, will be added.

(c) Pilots asking for "weather report for . . ." will be given the whole information for that place. The R/T operator in replying will follow the set order and will not read out the headings. To avoid confusion between visibility and cloud height, it should be noted that distance of visibility is always given in yards or miles and that height of lowest cloud is always given in feet. On the other hand, should the pilot ask for "Croydon visibility," the reply would be in the form "0800 Croydon 4,000 yards."

(d) In addition to the above-mentioned items, information relating to wind at various heights and places will also be available, but, as a rule, a delay of a few minutes will be necessary whilst such data, if requested, are being prepared.

5. *Report of Adverse Weather.*—Pilots *en route* encountering adverse weather conditions, of which no mention is made in the latest weather report, should transmit appropriate information to the nearest ground station for the benefit of other aircraft operating over the same route.

SECTION IV.—PROCEDURE.

1. The procedure herein laid down is applicable to both ground stations and aircraft. It has been compiled in the light of experience, and legislates for air traffic on a normal flying day.

It is essential that the correct procedure be adhered to by all concerned at all times, for, although irregularities may possibly cause no apparent delay or disorganisation when only one aircraft is flying, such irregularities will cause serious consequences when several aircraft are communicating. The Croydon R/T station is the controlling station for all R/T work on 900 metres wave within the British Isles, and, as such, its orders must be obeyed.

2. *How to call and answer.*—The method of calling up and answering is as follows :—

Continental GEXYZ wishes to establish communication with the Croydon station, and, having first ascertained that the station is disengaged, transmits :—

"Hullo Croydon, Continental GEXYZ calling Continental GEXYZ calling, message for you, over."

To which Croydon replies :—

"Hullo Continental GEXYZ, Hullo Continental GEXYZ, Croydon answering, Croydon answering, pass your message over."

NOTE (i) During communication the word "over" terminates each transmission. The words "switching-off" indicate that communication is finished.

(ii) This preliminary calling and answering is generally unnecessary in establishing touch in any of the subsequent classes of communication.

(iii) When making an initial call, the call signs of both the station called and the station calling are made twice. Communication once having been established, call-signs are transmitted once only.

3. In the following paragraphs are shown examples of R/T communication between Croydon station and an aircraft belonging to the fictitious Company "Continental Airways, Limited," and flying from London to Paris. These examples give the correct procedure respecting all subjects upon which communication is necessary, with the exception of D.F.

PROCEDURE ON LEAVING THE AERODROME.

The aircraft on leaving the aerodrome calls the ground station and passes a message giving its registration marking, its aerodrome of departure and its destination.

The aircraft transmits:—

"Hullo Croydon, Hullo Croydon, Continental GEXYZ calling, Continental GEXYZ calling, London to Paris, London to Paris, how are you receiving me, how are you receiving me, over."

Croydon replies:—

"Hullo Continental GEXYZ, Hullo Continental GEXYZ, Croydon answering, understand you are bound for Paris, understand you are bound for Paris, receiving you well, receiving you well, over."

To which the aircraft answers:—

"Hullo Croydon, Continental GEXYZ answering, that is correct, that is correct, switching off."

This signal and its acknowledgment by the ground station afford a test of the machines R/T apparatus and enables the aircraft to time its receiver. If the aircraft is not receiving well the ground station must be notified and requested to speak for 30 seconds so that the aircraft operator can make any adjustments necessary.

4. *Position Report.*—The aircraft, upon reaching Biggin Hill (a reporting point):—

"Hullo Croydon, Continental GEXYZ calling, passing Biggin Hill, passing Biggin Hill, over."

Croydon answers:—

"Hullo Continental GEXYZ, Croydon answering, understand you are passing Biggin Hill, understand you are passing Biggin Hill, over."

To which the aircraft answers:—

"Hullo Croydon, Continental GEXYZ answering, that is correct, that is correct, switching off."

The machine proceeds to the coast the next reporting point, where a similar message to the above is passed.

5. *Request for Weather Report.*—The weather being unsettled the pilot may desire information regarding conditions on the French coast, prior to crossing the Channel. The request is made thus:—

"Hullo Croydon, Continental GEXYZ calling, give me weather report for French coast, give me weather report for French coast, over."

The operator at Croydon thereupon transmits the most recent report for St. Inglevert:—

"Hullo Continental GEXYZ, Croydon answering, weather report for 0800 St. Inglevert, slight drizzle, 3 miles, 1,000 feet, weather report for 0800 St. Inglevert, slight drizzle, 3 miles, 1,000 feet, over."

This is received, duly acknowledged by the aircraft, and confirmed by the ground station.

6. *Report on Leaving Coast.*—The pilot of GEXYZ, considering the report satisfactory, leaves the English coast, reporting thus:—

"Hullo Croydon, Continental GEXYZ calling, now leaving Dover for Gris-Nez, now leaving Dover for Gris-Nez, over."

Croydon repeats message correctly, and the aircraft operator confirms it.

7. *Report of Adverse Weather.* In Mid-Channel adverse weather conditions are encountered and reported by the pilot in the following manner:—

"Hullo Croydon, Continental GEXYZ calling, clouds down to 200 feet in Channel, heavy rain squalls, clouds down to 200 feet in Channel, heavy rain squalls, over."

Croydon repeats the message correctly and the aircraft operator confirms it."

On receipt of this signal the operator at Croydon at once notifies the Meteorological Office there.

8. *Report on reaching Continental Coast.*—The pilot, on reaching the French coast, again reports position, and here the responsibility work of the British stations ceases nominally, the Continental stations thereafter taking over control.

9. *Example of Distress Call.*—The following is an example of the procedure to be adopted in making a distress call by R/T on the 900 metres aircraft wave:—

Mayday, Mayday, Mayday, continental GEXYZ, engine trouble, about 5 miles north of Gris-Nez, Mayday, etc."

This signal is made as frequently as time allows, and should give as much information as possible regarding nature of distress, position, etc. All ground stations and aircraft hearing this call immediately cease any R/T work upon which they may be engaged, and concentrate upon receiving the full message from the distressed aircraft. The Croydon and Pulham D/F stations plot the machine's position, and report it to the Croydon traffic officer, who takes all steps with the necessary authorities to render assistance according to the pre-arranged scheme.

10. *Failure to Receive.*—Failure to receive acknowledgments should not deter an aircraft from transmitting. For instance, an aircraft may develop a fault in its wireless receiver, in which case it should not fail to continue reporting its positions at the points along the route laid down above. At the same time great care must be taken to avoid unnecessary transmission.

11. *Phonetic Alphabet.*—The following phonetic alphabet is used by Government civil aviation stations:—

A = Ac.	N = Nuts.
B = Beer.	O = Orange.
C = Charlie.	P = Pip.
D = Don.	Q = Queen.
E = Edward.	R = Robert.
F = Freddie.	S = Sugar.
G = George.	T = Toc.
H = Harry.	U = Uncle.
I = Ink.	V = Vic.
J = Johnnie.	W = William.
K = King.	X = X-ray.
L = London.	Y = Yorker.
M = Monkey.	Z = Zebra.

This alphabet should be used whenever it may become necessary to have recourse to spelling words during radiotelephonic conversations.

REGULATIONS & PROCEDURE— DIRECTION FINDING.

II. —WIRELESS DIRECTION FINDING SERVICES: BRITISH ISLES, FRANCE, GERMANY AND ITALY.

GENERAL REMARKS.

1. Since, in giving an aircraft a bearing, reference is made to the time at which the readings are taken, it is essential that the aircraft's watch should be absolutely accurate. If there is any doubt as to the accuracy of the watch, a check should be at once carried out by calling the nearest route ground station, and obtaining the exact time (G.M.T. or B.S.T., as the case may be).

2. In order to avoid unnecessary interference and any consequent confusion or delay, an aircraft operator must invariably "listen in" before calling a station, to ensure that that station is not already engaged.

3. The bearings given by British aircraft D.F. stations may be accepted as accurate to within two degrees. Occasions may arise, however, when, owing to atmospheric conditions or interference, the operator at one or more of the ground stations may be dissatisfied with the accuracy of a bearing he has taken, and at the same time be unable to improve upon it. In order to differentiate between classes of bearings and positions the designation "first-class bearing or position" and "second-class bearing or position" will be applied. A position given to an aircraft with remark may be assumed to be the result of first-class bearings at all stations. Whenever a second-class bearing is obtained by any ground station the resultant position passed to the aircraft will be qualified as a second-class position. Traffic officers are empowered to refuse either bearings or positions to aircraft in exceptionally unfavourable conditions.

4. The D/F stations available for use by aircraft and the procedure to be employed are grouped by countries hereunder.

SECTION I.—BRITISH ISLES.

(a) Stations.

See also Directory Section—Land.

Croydon	..	Aircraft only.
Cullercoats	..	—
Pulham	..	Aircraft only.
Flamborough	..	201°, 310 yds. from Flam- borough Head Lighthouse.
Lizard	..	—
Niton	..	—

(b) Telephony Procedure.

(i) *In conjunction with Croydon and Pulham.*—The procedure, when using R/T, for an aircraft desiring to obtain its position by means of cross bearings from Croydon and Pulham, is as follows:—

Example.

Aircraft GEXYZ belonging to "Continental Airways, Ltd.," wishes to ascertain its position.

1st Action.

Aircraft calls Croydon and asks for its position:—

"Hullo Croydon, Continental, GEXYZ calling, position required, position required, over."

2nd Action.

Croydon replies:—

"Hullo Continental, GEXYZ, Croydon answering, Righto, Righto, speak for half a minute."

(In the event of other aircraft talking Croydon will order them to cease work until called, and THEY SHOULD IMMEDIATELY DO SO.) The reply "Righto" means that the stations are ready to take the bearings.

3rd Action.

The aircraft operator then speaks for half a minute, remembering that the stations are paying no attention to the actual words, and would not, therefore, hear if anything of importance were passed.

4th Action.

Pulham passes its bearing to Croydon. Croydon repeats back and passes its bearing to Pulham for check.

5th Action.

Croydon plots the position of the aircraft in conjunction with Pulham's bearing, and continues:—

"Hullo Continental GEXYZ, Croydon calling, position 2 miles true north of Canterbury at 1509, position 2 miles true north of Canterbury, at 1509, over."

6th Action.

Aircraft replies:—

"Hullo Croydon, Continental GEXYZ answering, understand position 2 miles north of Canterbury at 1509, position 2 miles north of Canterbury at 1509, over."

7th Action.

Croydon replies:—

"Hullo Continental GEXYZ, Croydon answering that is correct, that is correct, switching off."

NOTE.—In the event of repetitions being required by Croydon or Pulham, these will be asked for by Croydon only. Pulham will only communicate direct with an aircraft when it is flying north of London and is out of range of Croydon.

(ii) *In conjunction with either Croydon or Pulham only.*—The procedure, when using R/T, for an aircraft desiring to obtain a single bearing from Croydon or Pulham is as follows:—

Example.

Aircraft GEXYZ wishes to obtain a bearing from Croydon.

1st Action.

Aircraft GEXYZ calls Croydon and asks for its bearing:—

"Hullo Croydon, Continental GEXYZ calling, bearing required, bearing required, over."

2nd Action.

Unless Croydon has already obtained a satisfactory bearing that station replies :—

"Hullo Continental GEXYZ, Croydon answering, Righto, Righto, speak for half-minute, speak for half-minute, over."

3rd Action.

The aircraft then speaks for half a minute, remembering that Croydon is paying no attention to the actual words, and would not, therefore, hear if anything of importance were passed.

4th Action.

Croydon replies :—

"Hullo Continental GEXYZ, Croydon answering, true bearing 110 degrees at 1509, true bearing 110 degrees at 1509, over."

5th Action.

The aeroplane replies :—

"Hullo Croydon, Continental GEXYZ answering, understand true bearing 110 degrees at 1509, GEXYZ, understand true bearing 110 degrees at 1509, over."

6th Action.

Croydon replies :—

"Hullo Continental GEXYZ, Croydon answering, that is correct, that is correct, switching off."

(c) Morse Procedure.

(i) The following abbreviations are to be used :—

Signal	Meaning.
QTE ?	"What is my true bearing from you (or from)?"
QTE	"Your true bearing from me (or from) was..... degrees."
QTF ?	"What is my position determined by cross bearings from.....?"
QTF	"Your position determined by cross-bearings from..... is....."
QSY ?	"Shall I transmit with a wavelength of.....metres?"
QSY	"Change over to wavelength of..... metres."

(ii) *In conjunction with Croydon and Pulham.*

Example.

An aircraft GEXYZ using Morse procedure requires to ascertain its position as determined by cross bearings from Croydon and Pulham.

1st Action.

The aircraft calls Croydon :—

"CT GED GED GED de GEXYZ
GEXYZ GEXYZ QTF UD QTF UD AR."

2nd Action.

Croydon communicates with Pulham, and when the latter's station is ready, makes to the aircraft :—

"CT GEXYZ de GED K."

3rd Action.

On receipt of "K" the aircraft then makes :—

"CT GED de GEXYZ GEXYZ, (for 30 seconds)....GEXYZ."

4th Action.

Pulham passes its bearing to Croydon, and Croydon repeats back.

5th Action.

Croydon plots the position of the aircraft with her own and Pulham's bearing, and replies to the aircraft :—

"CT GEXYZ de GED QTF 2 miles true north of Canterbury at 1509 AR."

6th Action.

In order to confirm to Croydon that the aircraft has received the position correctly, she will repeat it back to Croydon :—

"CT GED de GEXYZ QTF 2 miles north of Canterbury at 1509 AR."

7th Action.

If the aircraft has received the position correctly Croydon will acknowledge, making the "end of work sign" :—

"CT GEXYZ de GED R VA."

NOTE.—In the event of repetitions being required by Croydon or Pulham, these will be asked for by Croydon only. Pulham will only communicate with an aircraft direct when it is flying north of London and is out of range of Croydon.

The procedure for obtaining a single bearing from one station only is similar to that outlined in the 1st Action of the above example, except that QTF is replaced by QTE.

(iii) In conjunction with other Ground Stations.

In the case of the other ground stations, if cross bearings are required to determine an aircraft's position, the stations should be called up together and the bearings taken in one operation. The aircraft calls the station or stations on the appropriate wave, making "QTE?" in conjunction with the call signals of the stations from which bearings are required. The station or stations called, when ready, answer in alphabetical order of their call signs, and make "K" ("go on").

Example.

An aircraft, whose call sign is GEXYZ, required a bearing from Berwick (BVG) and Flamborough (BVN).

1st Action.

The aircraft makes on 450 metres :—

"CT BVG BVG BVN BVN de GEXYZ
GEXYZ QTE UD AR."

2nd Action.

On receiving "K" from each station, the aircraft makes her own call signal for 60 seconds, and awaits the result.

3rd Action.

The stations reply (in alphabetical order of call signs) either asking the aircraft to repeat (UD) or giving the result. The result is given by the signal QTE, followed by the call signal of the D/F station, and by a group of three figures (000 to 359), indicating the true bearing from 000° to 359° of the aircraft from the station, reckoning clockwise from North (e.g. North = 000°, West = 270°). The result is given in the form :—

"CT GEXYZ GEXYZ de BVG 9.45 M
(time) BT QTE BVG 092 AR."
followed by :—

"CT GEXYZ GEXYZ de BVN 9.45 M
(time) BT QTE BVN 045 AR."

4th Action.

The aircraft, on receiving the result, acknowledges receipt in the ordinary way, repeating the bearing received from each station and makes VA ("end of work" sign). This sign is then repeated by the stations concerned. It is important that the "end of work" sign should not be omitted, since it not only indicates that the operation is finished, but it also shows that all concerned are about to resume normal watch.

NOTE.—The letter M or S following the time in the bearing signal denotes that the time stated is A.M. or P.M. respectively.

(d) General.

It should be noted that R/T will not normally be used for D.F. purpose for communicating with stations other than Croydon and Pulham.

SECTION II.—FRANCE.

(a) Stations.

See also Directory Section—Land.

Bernieres ..	—
Berre ..	—
Bizerte ..	—
Brest-Moulin du Seigneur	Service temporarily suspended.
Casablanca D.F. (Morocco)	Replies through Casablanca (CNP).
Cherbourg ..	The D.F. station works in conjunction with the ordinary W.T. traffic station.
Kenitra (Morocco)	—
Lorient.. ..	—
Marseille ..	—
Ouessant-Pen ar Roch	Replies through Ouessant (FFV)
Penmarch ..	—
Pointe du Raz	—
St. Nazaire ..	—
Soubise (Roche-fort)	—
Toulon-la-Mitre	—
Treguier St. Goner	—

(b) General.

At the present time no D.F. stations are being worked in France for purely aircraft purposes, the above mentioned stations being those operated primarily for the benefit of marine craft.

French D/F stations of small power keep watch on the wavelength of 600 metres; this wave must be used in all cases by aircraft for calling French ground stations in order to obtain bearings.

The ground station called replies on the 600 metres wave. The wave upon which the bearing is given can be either 450 metres or 800 metres, at the choice of the aircraft, which choice should be indicated in making the first call. The wavelength of 600 metres can be similarly utilised by aircraft which are not able to transmit and receive on 450 metres or 800 metres.

The results of observations are transmitted by the ground station on whichever wave is chosen. It should be noted, however, that Toulon and Casablanca always transmit bearings on 800 metres, irrespective of the wavelength upon which the bearing is taken.

The charge in respect of each bearing sent out by a French D/F station is six francs. The charges will be collected in the same manner as for wireless telegrams originating from ships.

(c) Procedure.

(i) The procedure is similar to that laid down for British D/F stations. The abbreviations to be used are:—

QTE ? "What is my true bearing from you (or from.....) ?"

QTE "Your true bearing from me (or from.....) is....."

The bearings are indicated by a group of three figures from 000 to 359, reckoning clockwise from North (North = 000°, West = 270°).

The procedure is to be observed as follows:—

1st Action.

The aircraft calls the station, or stations, on 600 metres, and transmits the signal "QTE ?" followed by the call signs of all the stations from which it requires bearings, and giving the wavelength upon which it desires the bearings to be given. It then listens in on 600 metres.

2nd Action.

The ground stations called prepare to take bearings and, when ready, reply in alphabetical orders of their call signs, instructing the aircraft, by the signal "K," to commence its transmission; the letter "K" is followed by a number giving the strength of the aircraft's signals as received by the ground station.

3rd Action.

On receiving the signal "K" the aircraft adjusts its transmitting gear to the wavelength chosen and transmits its call sign for 50 seconds. It then "listens in" on that wave.

4th Action.

The stations reply in alphabetical order of their call signs, either asking for the aircraft signal to be repeated, or giving the results of their observations by the signal "QTE" followed by a group of three figures indicating the bearing.

Example.

An aircraft GEXYZ requires bearings from Moulin du Seigneur (FEI) and Ouessant-Pen ar Roch (FEO). It desires to use the wavelength of 450 metres. The different operations will take place in the following order:—

1st Action.

GEXYZ calls the two stations on 600 metres:
"VE FEI FEI FEO FEO V GEXYZ
QTE ? FEI FEO 450 AR."

2nd Action.

GEXYZ having transmitted this signal listens on 600 metres.

3rd Action.

FEI replies on 600 metres:—
"VE GEXYZ V FEI 450 K6."

4th Action.

FEO replies on 600 metres:—
"VE GEXYZ V FEO 450 K7."

5th Action.

FEI and FEO adjust their instruments to 450 metres.

6th Action.

GEXYZ adjusts its transmitter to 450 metres and signals :—

" \overline{VE} FEI FEO V GEXYZ GEXYZ
GEXYZ.....(for 50 seconds) \overline{AR} ."

7th Action.

GEXYZ having transmitted this signal listens on 450 metres.

(the two stations having made their observations have, say, obtained the following results at 1545 G.M.T. :—
FEI 330° FEO 093°.)

8th Action.

FEI thereupon signals on 450 metres :—

" \overline{VE} GEXYZ V FEI I \overline{BT} 1545 QTE
330 \overline{AR} FEI."

9th Action.

GEXYZ having received this signal acknowledges receipt by transmitting :—

" \overline{VE} FEI V GEXYZ R II \overline{VA} ."

10th Action.

FEO transmits on 450 metres :—

" \overline{VE} GEXYZ V FEO 3 \overline{BT} 1545 QTE
010 \overline{AR} FEO."

11th Action.

GEXYZ having received this signal acknowledges receipt by sending :—

" \overline{VE} FEO V GEXYZ R II \overline{VA} ."

12th Action.

The stations repeat \overline{VA} , and then all resume their normal watch.

NOTE.—The numbers 1 and 3 having the sign \overline{BT} represent the number of the record on the stations' registers. The number 1545 refers to the Civil Mean Time of the Meridian of Greenwich.

If one of the stations (FEO for example) desires repetition, not having obtained a correct observation on the first transmission, it makes the signal :—

" \overline{VE} GEXYZ V FEO \overline{UD} ."

The aircraft then repeats the transmission of its call sign for a further 50 seconds, after which the remainder of the operation is as described above.

SECTION III.—GERMANY.

(a) Stations.

See also Directory Section—Land.

Borkum
I list
Nordholz
Wilhelmshaven Control Station.

(b) Procedure.

The stations belong to the State Marine, and are available for public use only when not in use by the Navy.

An aircraft requiring bearings should call Wilhelmshaven W/F station on a damped wave of 600 metres. That station makes the necessary arrangements with the D/F stations, and communicates the bearings or the position ascertained in latitude and longitude to the aircraft concerned. The D/F stations correspond with aircraft of other countries only through Wilhelmshaven station.

Example (i).

1st Action.

The aircraft calls the control station on 600 metres, and having established communication makes :—

" \overline{CT} KAN de GEXYZ \overline{BT} QTE QSV
600 \overline{AR} ."

2nd Action.

The control station answers and tells the aircraft to wait :—

" \overline{CT} GEXYZ de KAN \overline{VE} \overline{AS} ."

3rd Action.

The control station calls the three D/F stations on another wave, and, when they are ready to take bearings, makes :—

" \overline{CT} GEXYZ de KAN \overline{BT} BITTE VV
GEBEN \overline{AR} " ("Please send V's").

4th Action.

The aircraft then sends V's as requested :—

" \overline{CT} KAN de GEXYZ \overline{BT} V's (for 60
seconds) GEXYZ \overline{AR} ."

5th Action.

The control station collects the results on a different wave, and transmits them to the aircraft :—

" \overline{CT} GEXYZ de KAN \overline{BT} QTE 1018
(time) \overline{BT} KBO 012 (bearing) \overline{BT} KBQ
247 \overline{BT} KAO 350 \overline{VE} \overline{UD} \overline{AR} K."

6th Action.

If the aircraft has received the bearings, she replies :—

" \overline{CT} KAN de GEXYZ \overline{VE} \overline{VE} \overline{AR} \overline{VA} ."

7th Action.

The control station then makes :—

" \overline{CT} GEXYZ de KAN \overline{VE} \overline{VE} \overline{VA} ."

NOTE.—In the event of the aircraft requiring a repetition of the bearings, \overline{UD} will be substituted for \overline{VE} in the 6th Action above.

Example (ii).

An aircraft (call sign GEXYZ) requiring to ascertain her position by means of bearings from the three stations, the following procedure is to be employed :—

With the exception that QTF is substituted for QTE, the procedure is as in the first four Actions of Example (i) above until the three stations have passed the bearings to KAN.

5th Action.

KAN then makes to GEXYZ :—

"CT GEXZY de KAN BT QTF 1018
(Your position at 1018) IST.....
GRAD (is.....degrees.....)
MIN.....SEK NORD-BREITE.....
(mins.....secs.....north latitude)
GRAD.....MIN.....SEK..
OST-LANGE.....(degrees.....
minutes.....seconds.....east
longitude) AR K."

6th Action (et seq).

The procedure is then as in the last two actions of Example (i) above.

NOTE.—Mid-European time is used, the hours and minutes being expressed in four figures from 0001 to 2359.

SECTION III.—ITALY.

(a) *Station.*

See also *Directory Section—Land.*

Murano ... —

NOTE.—Bearings from this station are to be obtained by calling Carbonera (ICZ) on 600 metres, and are transmitted for Murano by Carbonera.

A charge of six francs is made for each bearing transmitted by an Italian W/T D/F station. The charges are collected in the same manner as for wireless telegrams originating from ships.

(b) *Procedure.*

The procedure is as follows :—

An aircraft whose call signal is GEXYZ wishes a bearing.

1st Action.

On a wave of 600 metres she will signal :—

"CT ICZ ICZ de GEXYZ QTE ?"

2nd Action.

Carbonera will answer :—

"CT GEXYZ de ICZ AS."

3rd Action.

Carbonera then wires Murano; when ready, Carbonera replies :—

"CT GEXYZ de ICZ K."

4th Action.

GEXYZ after 30 seconds signals :—

"CT ICZ de GEXYZ GEXYZ GEXYZ, etc." for 45 seconds.

(If dissatisfied with the bearing, Murano through Carbonera, will ask the aircraft to repeat.)

Carbonera signals :—

CT GEXYZ de ICZ UD.

GEXYZ repeats the signal as given above.)

5th Action.

When satisfied with the bearing, which is assumed to be 170° at 9.45, Murano will transmit it by telegraph to Carbonera, whence it is passed to the aircraft as follows :—

"CT GEXYZ de ICZ de IRM 9.45 M BT
QTE 170 AR ICZ."

6th Action.

GEXYZ acknowledges receipt :—

"CT ICZ de GEXYZ R VA."

AVIATION STATIONS.

A—ORGANISATION.

A.—ORGANISATION.

(1) The wireless services existing for the benefit of the civil air routes are carried out on three separate wavelengths :—

(a) 900 metres, which is reserved exclusively for ground-air communication.

(b) 1,680 metres, which is used for Route Weather messages.

(c) 1,400 metres, which is used for Route Traffic messages.

(2) The uses of the 1,400 metres wave are as follows :—

(a) *Aircraft arrivals and departures—Procedure.*

(i) *Arrivals.*—The Civil Aviation Traffic Officers in charge of the various route aerodromes will report all arrivals of aircraft at the stations under their control to :—

(a) The Officer in charge of the aerodrome from which the aircraft started.

(b) The aircraft owners representative on the aerodrome. For aircraft landing *en route*, notifications are sent to the aerodrome of departure and the aerodrome of destination.

(ii) *Departures.*—The departure of an aircraft is reported to the Officer in Charge of the aerodrome of destination. When a

machine which has landed *en route* resumes its flight, notification will be sent to both the aerodrome of departure and the aerodrome of destination.

(2) *Traffic Messages—Compilation and disposal of.*

(i) *Departure Messages.*—Messages announcing departures will contain the following information in the order shown :—

- (a) The aircraft registration marking.
- (b) The pilot's name.
- (c) The aerodrome of destination.
- (d) The time of departure.
- (e) The aircraft's load.

An example of this type of message would be :

"GEXYZ, Jones left for Paris 1000, five passengers, mail 100 lbs. goods."

(ii) *Arrival Messages.*—Messages announcing arrivals will contain the following information in the order shown :—

- (a) Aircraft's registration marking.
- (b) The time of arrival.

A typical message of this kind would be :—

"GEXYZ arrived 1210.

(3) *Priority Traffic.*—The following organisation is laid down for dealing with traffic of an urgent nature between the London Terminal Aerodrome and other termini :—

(a) *Prefixes.*—Messages of this nature are of two classes.

(i) Very urgent messages for which it is necessary to take special measures. This class will be known as "First class priority messages" and will be prefixed by the letter "P."

(ii) Messages of Security and Regularity (*e.g.* arrivals and departures) the transmission of which will always be given priority over ordinary messages dealing with the operations of the various air lines. This priority will be known as "Second Class priority," and will be prefixed by the letter "D."

(b) *Authority.*

(i) The Officer in Charge of the aerodrome of origin of a message is the *only* person empowered to authorise the despatch of a message as "First Class priority."

(ii) "Second Class priority" will be given to a message falling in that category by the Traffic Officer on duty at the time of despatch.

(c) *Scope.*

(i) The use of the "First Class" priority prefix will be limited to *urgent messages of safety, upon which immediate action is imperative*; as for example, messages containing instructions to prevent the departure of an aircraft for reasons of safety or messages ordering the recall of an aircraft which has already left. Under no circumstances will it be used for messages other than those concerned with the safety of life and with the safe conduct of the airways.

(ii) The "First Class" priority prefix will be applied regularly to route traffic messages of arrivals and departures, and will serve to ensure the rapid despatch and reception of these messages in preference to ordinary messages dealing with the operation of the various Air Transport Companies.

(4) *Interruption by Service.*—In the event of the wireless service between the different termini becoming interrupted for any reason, the following action is taken by the Officer in Charge of each terminal aerodrome :—

(i) A letter is handed to the pilot of any aircraft about to depart, addressed to the Officer in Charge at the aerodrome of destination, containing a recapitulation of arrivals and departures already carried out along the line and, if possible, information concerning departures likely to occur.

(ii) Simultaneously the normal routine for dealing with messages between the terminal aerodromes is carried out by the Officer in Charge, Croydon. These messages are passed in the ordinary manner to the Air Ministry Wireless Station, where they are bunched and despatched by cable to the following telegraphic addresses :—

(a) Port Aerien du Bourget.

(b) Port Aerien, Bruxelles.

(c) Instone, Bickendorf Aerodrome, Cologne.

(d) Haven-meester Luchtvaart, Rotterdam; or Transaera, Amsterdam.

At about 1500 or 1800 hours, or as necessity arises, consolidated messages dealing with the arrivals and departures at following aerodromes, are cabled by the following air administrations, addressed to : "Wireless, Air Ministry, London," where necessary action is taken for their disposal. All such messages will be repeated by W/T as soon as wireless communication is re-established.

(5) *Calibration.* In order to ensure regularity and uniformity of signalling on the 1,400 metre wavelength (and also on other wavelengths connected with civil aircraft routines) a system of calibrated wave transmissions is carried out by the Air Ministry Wireless Station.

B—WIRELESS TELEGRAPHY STATIONS IN OPERATION IN CONNECTION WITH CIVIL AIR ROUTES.

GENERAL REMARKS.

The information given in these tables relates only to stations, either situated actually upon aerodromes, or whose routine is directly concerned with flying operations and is primarily intended for aircraft.

Certain routine transmission by these stations are only carried out during that portion of the year when additional air services are being run owing to longer periods of daylight. Such transmissions are shown hereafter marked with an asterisk.

Details of those W/T stations whose meteorological routine is not primarily intended for aircraft, but which may indirectly have bearing

upon the operation of the air routes, are given in Meteorological Office Publication 252, which can be obtained from H.M. Stationery Office, or directly from the Meteorological Office, Air Ministry, price 2s. 6d.

The procedure to be adopted for W/T (Morse) communication between aircraft and the ground stations of the countries hereafter mentioned is as laid down in the "Handbook for Wireless Telegraph Operators of H.M. Postmaster-General" obtainable through any bookseller or from H.M. Stationery Office, price 6d.

Unless otherwise stated all stations use a C.W. system, and all times quoted are G.M.T.

SECTION I.—BRITISH ISLES.

SEE ALSO DIRECTORY SECTION—LAND STATIONS.

Station.	Wavelength in Metres.	Routine.
Air Ministry	900 1400 1680 4100*	<p><i>Wave calibration.</i></p> <p><i>Route Traffic Messages</i> with Le Bourget, Brussels, Rotterdam and Cologne as necessary.</p> <p><i>Hourly Route Meteor. Messages</i> are transmitted daily at 0336*, 0436*, 0536*, 0636*, 0736, 0836, 0936, 1036, 1136, 1236, 1336, 1436, 1536, 1636.</p> <p><i>Meteorological Synoptic Reports</i> are issued daily at 0200, 0600, 0800, 1400, 1900.</p> <p><i>Weather Shipping Reports</i> are issued daily at 0900 and 2000.</p> <p><i>European Collective Weather Reports</i> are issued daily at 0850 and 1450.</p> <p>In addition, the station makes a series of calibrated wave transmissions addressed to "CQ" daily as shown:—</p> <p>(1) At 0750, on 900 metres, a series of figures 1 (● ———) for 30 seconds, followed by a dash (—) lasting 5 seconds.</p> <p>(2) At 0745, on 1,400 metres, a series of figures 2 (● ● ———) for 30 seconds, followed by a dash (—) lasting 5 seconds.</p> <p>(3) At 0800, on 1,680 metres, a series of figures 3 (● ● ● ———) for 30 seconds, followed by a dash (—) lasting 5 seconds.</p> <p>Immediately following each 5-second dash, any necessary corrections will be transmitted as follows:—</p> <p><i>Indicating figure for the Wave</i> (i.e., "1," "2") BT followed by a four-figure group indicating the actual wave transmitted.</p> <p>If no correction is necessary VA will be made after each 5-second dash.</p> <p><i>Radiotelephonic communication</i> with aircraft in flight.</p> <p><i>Route Meteor. Messages</i> to Air Ministry at 0702, 1302, 1602, 1702, 1902.</p> <p><i>Radiotelephonic communication with aircraft in flight</i> (Croydon is the control station for this routine within the British Isles).</p> <p>D.F. Service for aircraft.</p> <p>W/T Routine as necessary.</p>
Castle Bromwich Aerodrome	900 1300	<p><i>Radiotelephonic communication with aircraft in flight.</i></p> <p><i>Route Meteor. Messages</i> to Air Ministry at 0702, 1302, 1602, 1702, 1902.</p>
Croydon (Air Port of London)	900	<p><i>Radiotelephonic communication with aircraft in flight</i> (Croydon is the control station for this routine within the British Isles).</p>
Guernsey	900 900 870 1300	<p>D.F. Service for aircraft.</p> <p>W/T Routine as necessary.</p> <p><i>Radiotelegraphic communication with aircraft in flight.</i></p> <p>As necessary.</p>
Lympne Aerodrome ..	900	<i>Radiotelephonic communication with aircraft in flight.</i>
Pulham Aerodrome ..	900	W/T Routine as necessary.
	900	D.F. work with Croydon.

* N.B.—In cases where delay in commencing transmission on 4,100 metres is occasioned, should transmission not have been commenced at the expiration of ten minutes, the message will be issued on 1,400 metres commencing at ten minutes after the routine hour.

§ Navigational warnings to airmen, as referred to in N. to A. No. 25 of 1922, are issued, when required, after the routine Synoptic Reports. Transmission is made on 4,100 metres (not 1,400 metres), and the above-mentioned N. to A. is amended accordingly.

SECTION I.—BRITISH ISLES—continued.

Station.	Wavelength in Metres.	Routine.
Renfrew Aerodrome ..	900 1300	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Meteor. Messages to Air Ministry at 0705, 1005, 1305, 1605, 1805.</i>
Bickendorf Aerodrome (Cologne). This station in Rhineland Occupied Territory is temporarily staffed and operated by the Department of Civil Aviation, Air Ministry	900 1400 1680	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic Messages with Air Ministry (GFA) and Brussels (OPVH) as necessary.</i> <i>Hourly Route Weather Messages are issued at 0916, 1016, 1116, 1216, 1316, 1416, 1516 daily. The station is open from 0900-1600.</i>
Lerwick (Meteorological observatory).	600 (Spark) 1400 (Spark)	<i>Communication with Wick for G.P.O. in cases of necessity.</i> <i>Meteor. Routine as requisite.</i>
Any R.A.F. or Civil Aviation Ground W/T Station.	—	The procedure for using this general call sign is as shown in the following example :— Aircraft G—EXYZ is about to make a forced landing and wishes to communicate with the nearest R.A.F. W/T station. The aircraft makes (in all cases stating its approximate position) :— CT GEZ GEZ GEZ de GEXYZ GEXYZ GEXYZ BT OVER ASHFORD 1400 aaa ENGINE TROUBLE AR. The nearest R.A.F. W/T station will then reply, using the call sign GEZ and stating its name, thus :— CT GEXYZ GEXYZ GEXYZ de GEZ GEZ GEZ BT HAWKINGE ANSWERING AR.

SECTION II.—BELGIUM.

Station	Wavelength in Metres.	Routine.
Haren (Air Port of Brussels)	900 1400	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic Messages as necessary.</i>
Ostende (Aerodrome) ..	1400 1680	<i>Route Traffic as necessary.</i> <i>Hourly Route Meteor. Messages at 0422, 0522, 0622, and every hour and 22 minutes till 1622.</i>
Brussels (Royal Meteor. Institute)	1680	<i>Meteor. Messages at 0422*, 0522*, 0622*, 0722, 0822, 0922, 1022, 1122, 1222, 1322, 1422, 1522, 1622.</i>

SECTION III.—FRANCE.

Station.	Wavelength in Metres.	Routine.
Le Bourget (Air Port of Paris)	900 1400 1680	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic as necessary.</i> <i>Hourly Route Weather Messages at 0328*, 0428*, 0528*, 0628*, 0728, 0828, 0928, 1028, 1128, 1228, 1328, 1428, 1528, 1628.</i>
St. Inglevert Aerodrome	900 1400 1680	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic Messages as necessary.</i> <i>Hourly Route Weather Messages at 0508*, 0608*, 0708, 0808, 0908, 1008, 1108, 1208, 1308, 1408, 1508, 1608.</i>
Abbeville	900 1400 1680	<i>R/T communication with aircraft in flight.</i> <i>Route Traffic as necessary.</i> <i>Hourly Route Meteor. Messages at 0502-1802, inclusive.</i>
Antibes	1680	<i>Route Traffic as necessary.</i>
Bayonne	1300	<i>Meteor. Messages at 0710, 0910, 1115, 1310, 1810.</i>
Bordeaux	1300 1500	<i>Route Traffic as necessary.</i> <i>Meteor. Messages.</i>
Dijon	1400	<i>Traffic as necessary.</i> <i>Meteor. Messages at 0715, 0945, 1315.</i>

SECTION III.—FRANCE—continued.

Station.	Wavelength in Metres.	Routine.
Lyon	1400	<i>Route Traffic Messages</i> as necessary. <i>Meteor. Messages</i> at 0640, 0710, 1310, 1800.
Marignane	1680	<i>Route Traffic</i> as necessary. <i>Meteor. Messages</i> at 0724, 0953, 1324, 1824.
Montelimar	1680	<i>Meteor. Messages</i> only at 0700, 0930, 1300 and 1800.
Nancy	1400 1450	<i>Traffic</i> as necessary. <i>Meteor. Messages</i> at 0515, 0615, 0715, 0915, 1015, 1115, 1315 and 1815.
Nîmes	1680	<i>Traffic</i> as necessary. <i>Meteor. Messages</i> at 0706, 0936, 1110, 1306, 1806.
Perpignan	1300	<i>Traffic</i> as necessary. <i>Meteor. Messages</i> at 0710, 0910, 1110, 1310, 1810.
Romilly-sur-Seine ..	1400	<i>Traffic</i> as necessary. <i>Meteor. Messages</i> at 0618, 0718, 0818, 0918, 1018, 1118, 1318.
Strasbourg	1400 1720 1720 or 2500	<i>Traffic</i> as necessary. <i>Meteor. Messages</i> at 0505, 0605, 0710, 0905, 1005, 1305, and 1805. <i>Traffic</i> with Prague.
Toulouse.. ..	1300	<i>Traffic</i> as necessary. <i>Meteor. Message</i> at 1105.
Valenciennes	1200 1400	<i>Route Traffic</i> as necessary. <i>Hourly Meteor. Messages</i> at 0540, 6605, 0705, 0805, 0905, 1105, 1205, 1305, 1405, 1505, 1605.

SECTION IV.—HOLLAND.

Station.	Wavelength in Metres.	Routine.
Soesterberg	1680	<i>Meteor. Route Messages</i> are issued daily at 0744, 0844, 0944, 1044, 1144, 1244, and 1344.
Rotterdam	900 1400	<i>Radiotelephonic communication</i> with aircraft in flight. <i>Route Traffic Messages.</i>

UNITED STATES OF AMERICA.

The Postal Radio Service is owned and operated by the Post Office Department.

The United States Air Mail Service has been experimenting with aircraft radio since February, 1919. Its principal efforts have been directed to the solution of the problem of Radio Direction Finding and Radio Field Localising. The solution of these problems has been pursued with the aid of the Bureau of Standards and data furnished by the Navy Department, with considerable original research by the Air Mail Service. A simplified Radio Direction Finder, based on the Robinson principle of fixed A and B coils, was evolved, and has been practically applied to single-manned planes of this service. Pilots with no previous experience have flown directly over the radio stations at destination by this means.

The problem of field localising jointly solved by the Air Mail Service and the Bureau of Standards, has resulted in the discovery and practical application of the so-called Radio Frequency

Field Localiser System. This system is brief, consists of two large horizontal single-turn coils in which radio frequency currents flow in opposite directions. As a result, the electro-magnetic field extends upwards in an expanding cone. An aeroplane utilising radio direction finding during periods of poor visibility can, of course, fly to the vicinity of the landing field. From this point the field localiser directs them to the immediate vicinity of the field itself.

During August, 1920, it was found that telegraph communication could not be furnished for the trans-continental Air Mail Service. As a result, it was decided on August 20th to install a chain of radio stations across the continent, tying in each of the Air Mail Fields.

There are eleven of these stations installed on or near various Air Mail fields. Those in operation are (1) College Park Md. 2 kw. Quenched Spark; (2) Bellefonte, Pa. 5 kw. Quenched Spark; (3) Omaha, Neb., 6 kw. Quenched Spark; (4) Cheyenne, Wyo., 2 kw. Arc.

Stations located at the following points have been in operation since October 15th:—(1) Salt Lake City, Utah, 2 kw. Arc; (2) Elko, Nevada, 2 kw. Arc; (3) Reno, Nevada, 2 kw. Arc. The following stations were completed on November 1st 1920:—(1) St. Louis, Mo., 5 kw. Quenched Spark; (2) North Platte, Nebr., 2 kw. Arc; (3) Rock Springs, Wyo., 2 kw. Arc.

These stations are not only used for inter-station traffic, but are also utilised for aeroplane radio communication and radio direction finding.

It is proposed to utilise all the radio stations of the Air Mail Service for Radio Research work, such as investigation of shifting signals, static and other kindred problems.

GERMANY.

The Koenigs Wusterhausen Station (Call Letters, LP) sends out notices for aircraft on a 3,600-metre wave at 1010 and 2010.

Additional information relating to Aircraft Wireless is contained in the Laws and Regulations section.



AIR MINISTRY CIVIL AVIATION RADIO STATIONS.

AIRCRAFT STATIONS

Name.	Call Signal.	Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).
FRANCE				
French Airships	FNA ¹	—	—	900
Naval Aircraft	FXA ²	—	French Navy	—
A.T.10 (Dirigible Balloon)	FXAIB	100	" " " "	600, 800 spk.
A.T.12 " "	FXAIC	100	" " " "	600, 800 spk.
A.T.14 " "	FXAID	100	" " " "	600, 800 spk.
A.T.15 " "	FXAIL	100	" " " "	600, 800 spk.
A.T.19 " "	FXAIQ	100	" " " "	600, 800 spk.
A.T.24 " "	FXAIU	—	" " " "	—
C.M.2. " "	FXAKD	—	" " " "	—
Méditerranée, " "	FXAIM	150	" " " "	600, 900 c.w.
V.Z.2 " "	FXAKC	100	" " " "	600, 800 spk.
V.Z.3 " "	FAKH	100	" " " "	600, 800 spk.
V.Z.4 " "	FXAKJ	100	" " " "	600, 800 spk.
V.Z.5 " "	FXAKM	100	" " " "	600, 800 spk.
V.Z.8 " "	FAKP	100	" " " "	600, 800 spk.
V.Z.10 " "	FXAKQ	100	" " " "	600, 800 spk.
V.Z.11 " "	FXAKS	100	" " " "	600, 800 spk.
V.Z.12 " "	FXAKT	100	" " " "	600, 800 spk.
V.Z.14 " "	FXAKU	100	" " " "	600, 800 spk.
V.Z.17 " "	FXAKY	100	" " " "	600, 800 spk.
V.Z.24 " "	FXAKZ	—	" " " "	—
Z.D.2 " "	FAJD	100	" " " "	600, 800 spk.
Z.D.3 " "	FAJN	100	" " " "	600, 800 spk.
Z.D.4 " "	FXAKB	100	" " " "	600, 800 spk.

¹Provisional General Call Signal for all French Aircraft keeping watch on 900 metres wavelength.

²General Call Signal for any aircraft of the French Navy.

Type.	Call Sign.	Range.	Controlled by.
GREAT BRITAIN			
Vimy	GEASI ..	—	Imperial Airways, Ltd., Croydon
Vulcan	GEBFC ..	—	" " " "
D.H.34	GEBBT ..	—	" " " "
D.H.34	GEBBV ..	—	" " " "
D.H.34	GEBBW ..	—	" " " "
D.H.34	GEBBY ..	—	" " " "
D.H.50	GEBFP ..	—	" " " "
H.P. W/8b	GEBBG ..	—	" " " "
H.P. W/8b	GEBBH ..	—	" " " "
H.P. W 8b	GEBBI ..	—	" " " "
Super-Marine Sea Eagle	GEBGR ..	—	" " Southampton
Super-Marine Sea Eagle	GEBGS ..	—	" " " "
R.A.F. Aircraft	GEA ¹ ..	—	Royal Air Force

¹ General Call Signal for any aircraft of the Royal Air Force.

Normal wavelength 900 metres c.w.

Radiotelegraphy on a wavelength of 600 metres is used only in case of distress.

Name.	Call Signal.	Range in Nautical Miles.	Controlled by.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).
HOLLAND				
Naval Aeroplanes	PBP ¹	—	—	—
HNACC (T)	HNACC	—	Dutch Navy	900, 600 ² c.w.

¹ General Call Signal for aeroplanes of Royal Dutch Navy, followed, when necessary, by the letter and number of a particular aeroplane.

² The wavelength of 600 metres is used only in cases of distress.



MAP OF THE LONDON TO PARIS, BRUSSELS, COLOGNE AIRWAYS.

Name.	Call Signal.	Range in Nautical Miles.	Controlled by.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).
ITALY				
Angelo Berardi	IXAAA	—	Ministry of War ..	600
F.6	ISAAG	—	Ministry of Commerce..	600
M.1	ISAAE	—	Ministry of Commerce..	600
M.6	IZAAC	—	Royal Naval Air Service	600
M.14	ISAAF	—	Ministry of Commerce ..	600
M.18	IZAAB	—	Royal Naval Air Service	600
O.8	ISAAH	—	Ministry of Commerce ..	600
P.V.3	IZAAD	—	Royal Naval Air Service	600
UNITED STATES OF AMERICA				
Balboa (T)	KFBA	100	Aeromarine Airways Inc.	300, 525, 600, C.W.
Shenandoah	NERK	—	U.S. Navy	—
Z.R.3	NERM	—	" "	—

THE MARKING OF AIRCRAFT—TABLE OF MARKS

Annex A of the Convention for the Regulation of Aerial Navigation, signed at Paris, the 13th of October, 1919, completed by the decisions of the C.I.N.A. (13th of July, 1922, 25th of October, 1922, 28th of February, 1923, and 26th of June, 1923).

Country.	Nationality Mark.	Registration Marks.
United States of America ..	N	All combinations made in accordance with the provisions of Section I (k)* of Annex A of the Convention, using a group of 4 letters out of the 26 of the alphabet, each group containing at least one vowel, e.g., ACDJ, PURN
British Empire ..	G	
France ..	F	
Italy ..	I	
Japan ..	J	All combinations made with H as first letter
Hedjaz ..	A	
Nicaragua ..	A	All combinations made with N as first letter
Albania ..	B	All combinations made with A as first letter.
Bulgaria ..	B	All combinations made with B as first letter
Latvia ..	B	All combinations made with L as first letter
Bolivia ..	C	All combinations made with R as first letter
Cuba ..	C	All combinations made with C as first letter
Switzerland ..	C	All combinations made with H as first letter
Portugal ..	C	All combinations made with P as first letter
Roumania ..	C	All combinations made with H as first letter
Uruguay ..	C	All combinations made with U as first letter
Esthonia ..	E	All combinations made with A as first letter
Ecuador ..	E	All combinations made with E as first letter
Hayti ..	H	All combinations made with L as first letter
Hungary ..	H	All combinations made with M as first letter
Holland ..	H	All combinations made with N as first letter
Siam ..	H	All combinations made with S as first letter
Costa Rica ..	K	All combinations made with C as first letter
Finland ..	K	All combinations made with S as first letter
Czecho-Slovakia ..	L	All combinations made with B as first letter
Guatemala ..	L	All combinations made with G as first letter
Liberia ..	L	All combinations made with L as first letter
Luxemburg ..	L	All combinations made with U as first letter
Spain ..	M	All combinations made with A, B, C, D, E, F, G, H, I, J, K, L, M or N as first letter
Monaco ..	M	
Brazil ..	P	All combinations made with O as first letter
Poland ..	P	All combinations made with P as first letter
Belgium ..	O	All combinations made with B as first letter
Peru ..	O	All combinations made with P as first letter
Sweden ..	S	All combinations made with A as first letter
Greece ..	S	All combinations made with G as first letter
Panama ..	S	All combinations made with P as first letter
Denmark ..	T	All combinations made with D as first letter
China ..	X	All combinations made with C as first letter
Honduras ..	X	All combinations made with H as first letter
Serbs, Croats and Slovenes (Kingdom of) ..	X	All combinations made with S as first letter
Lithuania ..	Z	All combinations made with L as first letter

* These provisions are : The nationality mark shall be represented by capital letters in Roman characters, e.g., France F.

The registration mark shall be represented by a group of four capital letters ; each group shall contain at least one vowel, and for this purpose the letter Y shall be considered as a vowel.

The complete group of five letters shall be used as a call sign of the particular aircraft in making or receiving signals by wireless telegraphy or other methods of communication, except when opening up communication by means of visual signals, when the usual methods will be employed.

CALL SIGNS

Call Sign.	Station.	Country.	Call Sign.	Station.	Country.
FAJD	Z.D.2	France	GEBBG	Imperial Airways, Ltd., Croydon	Gt. Britain
FAJN	Z.D.3	"		Aircraft	"
FAKH	V.Z.3	"	GEBBH	" "	"
FAKP	V.Z.8	"	GEBBI	" "	"
FNA ¹	French Airships	"	GEBBT	" "	"
FXA ¹	Naval Aircraft ..	"	GEBBV	" "	"
FXAIB	A.T.10	"	GEBBW	" "	"
FXAIC	A.T.12	"	GEBBY	" "	"
FXAID	A.T.14	"	GEBFC	" "	"
FXAIL	A.T.15	"	GEBFP	" "	"
FXAIM	Méditerranée ..	"	GEBGR	Imperial Airways, Ltd., Southamp- ton Aircraft	"
FXAIQ	A.T.19	"			
FXAIU	A.T.24	"	GEBCS		
FXAKB	Z.D.4	"	HNACC	HNACC (T) ..	Holland
FXAKC	V.Z.2	"	ISAAE	M.1	Italy
FXAKD	C.M.2	"	ISAAF	M.14	"
FXAKJ	V.Z.4	"	ISAAG	F.6	"
FXAKM	V.Z.5	"	ISAAH	O.8	"
FXAKQ	V.Z.10	"	IXAAA	Angelo Berardi ..	"
FXAKS	V.Z.11	"	IZAAB	M.18	"
FXAKT	V.Z.12	"	IZAAC	M.6	"
FXAKU	V.Z.14	"	IZAAD	P.V.3	"
FXAKY	V.Z.17	"	KFBA	Balboa	U.S.A.
FXAKZ	V.Z.24	"	NERK	Shenandoah ..	"
GEA ¹	R.A.F. Aircraft	Gt. Britain	NERM	Z.R.3	"
GEASI	Imperial Airways, Ltd., Croydon Aircraft	"	PBP ¹	Naval Aeroplanes	Holland

¹ General Call Signal.

SCIENTIFIC SIGNAL SECTION

INTRODUCTION

The detailed information set out in this Section will be found under the following headings:—

(1) METEOROLOGICAL SECTION :

- (a) The International Code, French Meteorological Code, German Meteorological Code, Japanese Meteorological Code, American Code
- (b) Tables
- (c) Tabulated particulars of the different issues under Countries

(2) TIME SIGNAL SECTION :

- (a) Explanation and notes on the Rhythmic (or Vernier) Time Signals
- (b) Time Signal Codes in Chart Form
- (c) Tabulated particulars of the different issues under Countries

(3) HYDROGRAPHIC SECTION :

- (a) The International Safety Signal (Regulations)
- (b) Tabulated matter relating to Ice warnings and other Navigational warnings, under Countries

(4) GENERAL SECTION :

- (a) The Scientific Signals of the Union Radio-scientifique Internationale (U.R.S.I.)
- (b) Standard Frequency Waves
- (c) Earthquake Information and Codes
- (d) Ship Distress Signals, General Regulations and Tabulated Particulars under countries
- (e) Aviation Distress Signals
- (f) Fog Signals—Tabulated under Countries
- (g) Free Medical Advice to Seamen

In compiling this Section every effort has been made to give accurate and "up-to-date" details. This has only been possible by the assistance given by the Directors of the various Observatories and Services concerned, and the Editor wishes to take this opportunity of thanking all those who have complied with his request for information. In addition, the following publications have been consulted and acknowledgment is hereby made:—

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- "Funk-Wetter," 1924 (Deutsche Seewarte).
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(1) METEOROLOGICAL SECTION.

The *INTERNATIONAL COMMISSION OF WEATHER TELEGRAPHY* is the body charged with the responsibility of devising the International Code for unifying the system of collecting and distributing meteorological information by wireless. The nature and also the extent of the present arrangements are set out in the pages which follow.

Meteorological information issued by W/T. comes within one or more of these headings:—

(a) *A Weather Report*, which is a statement of the present or existing weather conditions. This report may be (1) for a single station only, or (2), as is generally the case, it covers a comparatively large area (*i.e.*, a whole country or continent), and comprises weather data such as surface observations, "upper-air" temperatures and humidities collected by land-line and wireless from different sub-stations and sent to the Central Meteorological Observatory. In the latter case, the message is known as a "Synoptic Data Message." When the information contained therein is decoded, which may easily be done with the help of the Code tables given below, and the data plotted on a chart, which is called a Synoptic Chart, a forecast can be made of the weather in the locality covered by the Chart.

(b) *A Weather Forecast*, which is an opinion of future weather conditions issued by a Central Meteorological Observatory in possession of the information to be obtained from a Synoptic Chart.

(c) *A Storm Warning*, which is only broadcast when weather conditions are abnormal and shipping or aviation is thereby endangered.

ABBREVIATIONS.

The following abbreviations are used throughout the section :—

- bar = barometer or barometric.
- (c) = Coastal station.
- °c = degrees centigrade.
- cw = continuous wave.
- F = Forecast.
- °F = degrees Fahrenheit.
- G.M.T. = Greenwich Mean Time (civil, *i.e.* reckoned from midnight),
- I = Ice report.
- I.C.W. = tonic train
- idem = the same as (French Meteorological Code).
- (L) = Inland station.
- L.T. = local time.
- m = metres.
- mb = millibar(s).
- mm = millimetres.
- mod = modified.
- m.s.l. = mean sea level.
- N = Navigation warning.
- N.I.C. = International Code.
- O = Ship observations from ships at sea.
- ob = observation(s) or observatory.
- O.I.C. = Old International Code.
- p.l. = plain language.
- R/T = Radio-telephony. —
- S = surface observations.
- sp. = spark.
- temp. = temperature.
- T.S. = Time Signal.
- U.A.T. = Upper air temperature observations.
- U.W. = Upper air wind observations.
- U.R.S.I. = Union Radioscopique Internationale.
- q.v. = refer to
- W. = Storm warning.
- W.R. = Weather report.
- [] Signifies that word(s) or figure(s) printed within these brackets vary according to the time of message.
- “ ” Signifies that letters or figures contained within inverted commas are sent exactly as printed and are not coded.
- * An asterisk inserted after the time of a message indicates that
- † the message follows a Time Signal; a dagger † that it follows immediately after a Weather Report.

CODES

THE INTERNATIONAL CODE (abbreviated as N.I.C.)

I.—THE SYMBOLS AND THEIR MEANINGS.

- A = Form of *predominating cloud lowest* in the scale of cloud forms (*see* Code VI).
- a = Form of *predominating cloud highest* in the scale of cloud forms when more than one type of cloud exists (*see* Code VI).
- BBB = Pressure in millibars and tenths (initial 9 or 10 omitted), or millimetres and tenths (initial 7 omitted). The values refer to sea level and include all corrections for index error, temperature and gravity.

- BB = Pressure in whole millibars or whole millimetres (initial 9, 10 or 7 omitted). (For upper air reports of pressure, temperature and humidity, BB is in whole millibars with the hundreds figure omitted, whether this is 9, 8, 7, 6, or 5.)
- B₁B₁B₁ = Pressure in whole millibars at an "inversion of temperature" in upper air reports.
- b = Amount of barometric tendency during the three hours preceding the time of observation expressed in half-millibars or half-millimetres. For tendencies 10-19 the *second* figure only is reported and 33 is added to the wind direction number (DD). For tendencies greater than 29 the second figure only is reported and 67 added to the wind direction number. Tendencies greater than 29 are reported as 29.
- bb = Amount of barometric tendency during the three hours preceding the time of observation expressed in half millibars or half millimetres.
- C = Form of predominating cloud, according to the scale of cloud forms, when only one form is reported, as from ships at sea (*see* Code VI).
- C₁ = Form of cloud observed by nephoscope; usually one of the two highest layers present (*see* Code VI).
- Ca = Form of low cloud observed by nephoscope in reports for aviation (*see* Code VI).
- c = Characteristic of barometric tendency during the period of 3 hours preceding the time of observation (*see* Code II).
- DD = Direction of the wind near the ground on the scale (01-32) in which 08 = East, 16 = South, etc., 00 = calm.
- dd = Direction of wind in the upper air, or of cloud movement, on the scale (01-36), *i.e.*, degrees from North divided by 10 and rounded off to the nearest whole number (00 = calm).
- d = Direction from which swell comes on scale (0-8), in which 2 = East, 4 = South, etc., 0 = no swell.
- ds = Direction of movement of ship on scale (0-8), in which 2 = Eastwards, 4 = Southwards, etc.
- F = Force of the wind on the Beaufort Scale. (Forces above 9 are reported as 9 in telegrams, with the actual force in a word at the end, *e.g.*, force 10 is reported at the end as "Storm ten," force 11 as "Storm eleven." Ships at sea, however, report "gale ten," "storm eleven," "hurricane twelve.")
- F₁ = Approximate speed of low cloud (*see* Code XIV).
- GG = Greenwich Time of observation (01 = 1 a.m., 12 = noon, 13 = 1 p.m., 24 = midnight).
- H = Relative humidity of the air (*see* Code V).
- h = Height of base of lowest cloud present (*see* Code VII).
- H₁ = Heights at which upper air temperature and humidity are reported (no code figure telegraphed) (*see* Code XII).
- h₁ = Height at which upper wind is reported (*see* Code XI).
- I_nI_n = Index number of station.
- K = The characteristic of the swell *in the open sea* (*see* Code IX (a)).
- K' = Amount and characteristic of barometric tendency expressed by a single figure (*see* Code II (a)).
- L = Amount of sky (scale 0-10) covered by cloud form A and all forms of the same layer (*i.e.*, low, medium or high) as A, if "a" refers to a different layer.
- LLL = Latitude in degrees and tenths, the tenths being obtained by dividing the number of minutes by 6 and neglecting the remainder.
- lll = Longitude in degrees and tenths, the tenths being obtained as for latitude LLL.

- MM = Maximum temperature in the interval of 11 hours ending at 18 h. G.M.T. (or at one of the hours 1 h., 7 h., 13 h., 18 h. G.M.T., following not less than 4 hours after noon, local time).
- mm = Minimum temperature in the interval of 13 hours ending at 7 h. G.M.T. (or at the hour 13 hours after the time of reporting the maximum temperature).
- N = Total amount of sky covered with cloud (scale 0-10).
- P = Day of the week. 1 = Sunday, 2 = Monday, 3 = Tuesday, 4 = Wednesday, 5 = Thursday, 6 = Friday, 7 = Saturday. The day refers to G.M.T. and not to local time, *e.g.*, Sunday means the period from 0 h. to 24 h. on Sunday at Greenwich.
- Q = Quarter of globe in which ship is situated (*see* Code XIII).
- RR = Rainfall [at 7 a.m. for preceding 13 hours and at 6 p.m. for preceding 11 hours (*see* Code VIII)].
- R = Amount of rainfall for the preceding 24 hours (*see* Code VIII (a)).
- r = Time of commencement of precipitation (*see* Code X).
- S = State of the sea and swell (coast stations) (*see* Code IX).
- TT = Temperature of the air in whole degrees Fahrenheit or Centigrade (50 added to negative values).
- tt = Temperature of the sea (surface water) in whole degrees.
- TTT = Temperature of air in degrees and tenths Fahrenheit or Centigrade (500 added to negative values).
- ttt = Temperature of the sea (surface water) in degrees and tenths.
- t₁t₁ = Increase in temperature at an "inversion" in whole degrees.
- V = Visibility or distance at which objects can be seen in daylight (or at which lights can be seen at night) (*see* Code IV).
- v = Visibility at sea from ships at sea (*see* Code IV (a)).
- V_s = Visibility towards the sea (from coast stations) (*see* Code IV).
- VV = The relative speed of clouds as determined by nephoscope and such that the actual speed of the cloud will be given in kilometres per hour by the equation $vv = \frac{h}{1000} \times VV$, if "h," the height of the cloud, is expressed in metres. This unit is the "radian per hour."
- vv = The speed of the wind in the upper air in kilometres per hour or miles per hour (for values greater than 99 the last two figures only are used and 50 is added to the number indicating wind direction dd).
- W = The weather in the interval since the preceding time of report. This interval is 5, 6 or 7 hours for stations reporting 4 times daily. (For special reports for aviation it is 1 hour or 2 hours) (*see* Code III).
- ww = The actual weather at the time of observation with which is combined, whenever possible, the general character of the weather (*see* Code I).
- w₁ = The initial figure of the code ww, thus indicating the general state of the weather.
- x₁ = A check figure obtained by adding the first four figures of the group and taking the units figure in the sum so obtained.
- x₂, x₃, x₄, x₅ = Check figures obtained in a similar manner.
- y₁ = A check figure obtained by adding together the first figure of each of the preceding groups, thus: Q + P + B + F + w, and taking the units figure of the sum.
- YY = Day of month.
- y₂, y₃, y₄ = Check figures obtained in a similar way from the 2nd, 3rd and 4th figures respectively.
- z = Key figure obtained by adding together all the x's or all the y's.

II.—SYMBOLIC FORM OF MESSAGES.

(I) REPORTS FROM LAND STATIONS.

- (a) The form for observations at 0100 and 1300 G.M.T. is—
 BBBDD FwwTT cbWVH ALaNh C₁ddVV,
 and for observations at 0700 and 1800 G.M.T.—
 BBBDD FwwTT cbWVH ALaNh RRjjr C₁ddVV,
 where jj in the fifth group is replaced, as follows:—

	Inland Stations.	Coastal Stations.
at 0700 G.M.T.	mm	SV _s
at 1800 G.M.T.	MM	SV _s

The group C₁ddVV, containing cloud observations by nephoscope, is omitted entirely* if no such observations are available.

(b) *Upper Winds* are reported by groups of the form h₁ddvv, one group being used for each height.

(c) *Upper Air Temperatures and Humidities* are reported by groups of the form BBTTH.

In this case no figure is telegraphed to indicate the height, it being understood that the groups refer to the heights of the code H₁ in order.

Inversions are reported at the end by groups 00000 B₁B₁B₁t₁t₁, the first being an index group indicating that an inversion is reported, while B₁B₁B₁ is the pressure in whole millibars at the height of the inversion, and t₁t₁ the increase of temperature in whole degrees.

(d) In *Collective Messages* the observations of *each* station are preceded by a group consisting of the index number of the station (usually two figures) by which it is identified. The messages are arranged in sections, the first containing the ordinary observations from *all* stations, the second, preceded by the word "Pilot" or an equivalent, containing all reports of upper wind and the third, preceded by "Temp" or an equivalent, containing all observations of upper air temperature.

Any other observations, such as those from ships, form a fourth section.

The symbolic form of a complete message, embracing surface observations at 0700 or 1800 G.M.T., upper winds and upper air temperatures and humidities, would be as follows, where the observations contained in the groups in each line, refer to the stations indicated by the index figures, I₁I₁, I₂I₂, etc., preceding them.

	I ₁ I ₁	BBBDD	FwwTT	cbWVH	ALaNh	RRjjr	(C ₁ ddVV)
	I ₂ I ₂	BBBDD	FwwTT	cbWVH	ALaNh	RRjjr	(C ₁ ddVV)
	I ₃ I ₃	BBBDD, etc.,					
	etc.						
	etc.						
Pilot	I ₁ I ₁	h ₁ ddvv	h ₁ ddvv	h ₁ ddvv.			
	I ₂ I ₂	h ₁ ddvv	h ₁ ddvv	h ₁ ddvv.			
	I ₃ I ₃	h ₁ ddvv, etc.					
	etc.						
	etc.						
Temp.	I ₁ I ₁	BBTTH	BBTTH, etc.				
		B ₁ B ₁ B ₁ t ₁ t ₁ , etc.					
	I ₂ I ₂	BBTTH	BBTTH, etc.				
		B ₁ B ₁ B ₁ t ₁ t ₁ , etc.					
	I ₃ I ₃	BBTTH, etc.,					
	etc.						
	etc.						

For observations at other hours the form would be the same, except that the group RRjjr would not be included.

* The general rule in reports of all kinds is, however, that missing figures shall be replaced by hyphens (one for each figure).

(2) REPORTS FROM SHIPS AT SEA.

These are in the form :—

Q L L L x₁ P l l l x₂ B B D D x₃ F v K d x₄ w w G G x₅ y₁ y₂ y₃ y₄ z₅
 { C N T T d₃ W r t t K' (if temperature on Fah. scale).
 { C N T T T W r t t t (if temperature on C. scale).

An alternative form for use without check figures is :—

P Q L L L l l l G G B B D D F w w v K d.
 { C N T T d₃ W r t t K' (if temperature on Fah. scale).
 { C N T T T W r t t t (if temperature on C. scale).

(Both these forms are operative at present, but a decision between the two forms is to be made by the Permanent International Meteorological Committee after consultation of the different services affected.)

(3) HOURLY REPORTS FOR AVIATION AND OTHER SPECIAL PURPOSES.

(a) The normal form for hourly reports is :—

I_n I_n (V_s) w w V h L N D D F W
 with the addition, every three hours, of a group—
 C_a d d F₁ S,
 where C_a is the type of cloud to which d d F₁ refer.

(b) If fuller information is required, then every three or six hours the form is—

I_n I_n (V_s) B B B D D F w w T T c b W V H A L a N h (C_a d d F₁ S).

NOTE.—When, for any reason, V_s is not available, *no* hyphen is inserted in its place. If none of the information in the group C_a d d F₁ S is available the whole group is omitted. In all other cases hyphens are used, in the normal way, to denote lack of information.

(4) ABBREVIATED REPORTS FOR COLLECTIVE MESSAGES COVERING A WHOLE CONTINENT.

The form of report for each station is :—

B B D D F w₁ T T K' R for observations at 0700 G.M.T. ;
 B B D D F w₁ T T K' W for observations at other hours.

(5) SPECIAL FORM FOR REPORTS FROM ICELAND AND THE FAEROES.

(i) *Observations at 0100 and 0700 G.M.T. reported together :—*

Thorshavn and Reykjavik :

B B c b b B B D D F w w T T c b W V H A L a N h R R S V_s r (C₁ d d V V).

Other stations :

B B c b b B B D D F w w T T c b W A N, where the first group in each case refers to 0100 G.M.T.

(ii) *Observations at 1300 and 1800 G.M.T. :—*

Thorshavn and Reykjavik :

1300 :—B B B D D F w w T T c b W V H A L a N h (C₁ d d V V).

1800 :—B B B D D F w w T T c b W V H A L a N h R R S V_s r (C₁ d d V V)

Other stations :

1300 and 1800 :—B B B D D F w w T T c b W A N.

III.—SPECIFICATION OF THE SCALES.

CODE I.

Weather at actual time of observation and general character of weather (ww).

NOTES.—The figures are grouped to refer to particular phenomena, for example, 20 to 29, Fog or Mist.

In selecting the appropriate number for the report, no account is taken of phenomena which occurred more than one hour before the time of observa-

tion, but only of phenomena which occurred during the interval of one hour preceding the fixed time of observation.

		Code figures.
<i>Blue Sky or Some Cloud. (Cloud 0-5)</i>	Cloud has decreased	00
	No apparent change	01
	Cloud has increased	02
	Precipitation within sight	03
	With solar or lunar halo	04
	After fog or mist (or dust storm)	05
	After rain or drizzle	06
	After snow, sleet or hail	07
	With or after thunder and lightning in neigh- bourhood	08
	After thunderstorm	09
<i>Cloudy or Overcast Cloud 6-10)</i>	Cloud has decreased	10
	No apparent change	11
	Cloud has increased	12
	Precipitation within sight	13
	With solar or lunar halo	14
	After fog or mist (or dust storm)	15
	After rain or drizzle	16
	After snow, sleet or hail	17
	With or after thunder and lightning in neigh- bourhood	18
	After thunderstorm	19
<i>Fog or Mist</i>	Fog or mist but clear in zenith	just 20
	" and apparently overcast	begun 21
	" but clear in zenith	inter- 22
	" and apparently overcast	mittent 23
	" but clear in zenith	for some 24
	" and apparently overcast	time. Has 25
		become
		thinner.
	Fog or mist but clear in zenith	for some 26
	" and apparently overcast	time. 27
<i>Fog or Mist</i>	" but clear in zenith	for some 28
	" and apparently overcast	time. Has 29
		become
		thicker.
	Slight with rain	30
	" hail or rain and hail	31
	" sleet	32
	" snow	33
	Heavy with rain ; has become better	34
	" rain	35
<i>Passing Showers.</i>	" rain ; has become worse	36
	" hail or rain and hail	37
	" sleet	38
	" snow	39
	Slight occasional	40
	" continuous	41
	" but has increased	42
	Moderate but has decreased	43
	" occasional	44
	" continuous	45
<i>Drizzle</i>	" but has increased	46
	Thick but has decreased	47
	" occasional	48
	" continuous	49



III.—SPECIFICATION OF THE SCALES—*continued.*

CODE I—*continued.*

						Code figures.
<i>Rain</i>	{	Slight	occasional	..	..	50
		"	continuous	..	..	51
		"	but has increased	..	..	52
		Moderate	but has decreased	..	..	53
		"	occasional	..	..	54
		"	continuous	..	..	55
		"	but has increased	..	..	56
		Heavy	but has decreased	..	..	57
		"	occasional	..	..	58
		"	continuous	..	..	59
<i>Snow or Snow and Hail.</i>	{	Slight	occasional	..	..	60
		"	continuous	..	..	61
		"	but has increased	..	..	62
		Moderate	but has decreased	..	..	63
		"	occasional	..	..	64
		"	continuous	..	..	65
		"	but has increased	..	..	66
		Heavy	but has decreased	..	..	67
		"	occasional	..	..	68
		"	continuous	..	..	69
<i>Sleet or Rain and Snow</i>	{	Slight	occasional	..	..	70
		"	continuous	..	..	71
		"	but has increased	..	..	72
		Moderate	but has decreased	..	..	73
		"	occasional	..	..	74
		"	continuous	..	..	75
		"	but has increased	..	..	76
		Heavy	but has decreased	..	..	77
		"	occasional	..	..	78
		"	continuous	..	..	79
<i>Hail or Rain and Hail.</i>	{	Slight	occasional	..	..	80
		"	continuous	..	..	81
		"	but has increased	..	..	82
		Moderate	but has decreased	..	..	83
		"	occasional	..	..	84
		"	continuous	..	..	85
		"	but has increased	..	..	86
		Heavy	but has decreased	..	..	87
		"	occasional	..	..	88
		"	continuous	..	..	89
<i>Thunderstorm (or Line squall)</i>	{	Slight	thunderstorm without hail	..	..	90
		"	" with hail	..	..	91
		Moderate	thunderstorm without hail	..	..	92
		"	" with hail	..	..	93
		Heavy	thunderstorm without hail	} without gale	..	94
		"	" with hail		..	95
		"	" without hail		..	96
		"	" with hail		..	97
		Line squall	without hail	..	..	98
		"	" with hail	..	..	99


SYMBOLIC VERSION OF ABOVE CODE (FOR SYNOPTIC CHARTS).

Present Weather Code (ww):

First fig. }	0	1	2	3	4	5	6	7	8	9	
Second figure.	0	bc—	bc	bc+	bcv	bc⊕	bc/f	bc/r	bc/s	bct1	bc/tlr
	1	co—	co	co+	cov	co	co/f	co/r	co/s	cot1	co/tlr
	2	fb	fo	ifb	ifo	fb—	fo—	ffb	ffo	fb+	fo+
	3	pr _o	ph _o	prs _o	ps _o	PR—	PR	PR+	PH	PRS	PS
	4	d _o	d _o d _o	d _o +	d—	d	dd	d+	D—	D	DD
	5	r _o	r _o r _o	r _o +	r—	r	rr	r+	R—	R	RR
	6	s _o	s _o s _o	s _o +	s—	s	ss	s+	S—	S	SS
	7	rs _o	rs _o rs _o	rs _o +	rs—	rs	rsrs	rs+	RS—	RS	RSRS
	8	h _o (r _o)	rh _o rh _o	h _o (r _o)+	h(r)—	h(r)	rhrh	h(r)+	H(R)—	H(R)	RHRH
	9	tlr _o	tlrh _o	tlr	tlrh	TLR	TLRH	TLR 	TLRH 	KQ	KQH

A solidus (/) such as occurs in the combination "bc/r," separates weather at the time of observation from the preceding weather, bc/r thus indicates "fine or fair after rain or drizzle."

The letters have the following meanings:—

- b = fine (blue sky; not more than $\frac{1}{4}$ sky covered).
- bc = fair sky partly cloudy, $\frac{1}{2}$ covered).
- c = cloudy (sky $\frac{3}{4}$ covered).
- d = drizzle.
- f = fog.
- h = hail.
- i = intermittent (occasional).
- j = adjacent (*i.e.*, in vicinity of station).
- KQ = line squall.
- l = lightning.
- o = overcast.
- p = passing showers.
- r = rain.
- s = snow.
- t = thunder.
- tlr = thunderstorm.
- ⊕ = halo.
-  = gale.

The following additional letters are sometimes used in maps:—

- e = wet air without rain falling (a copious deposit of water on trees, buildings or rigging).
- g = gloomy.
- m = mist.
- q = squally.
- u = ugly, threatening.
- v = extreme visibility (the horizon or distant hills unusually clear).
- w = dew.
- x = hoar frost.
- y = dry air (humidity below 60 per cent.).
- z = haze (dust haze, the turbid atmosphere of dry weather).

CODE II.

Characteristic of Barometric Tendency during the three hours preceding the time of observation (c).

Code figure.				
0 = 0 or +	Steady or rising	} The barometer is now higher than or the same as three hours ago.
1 = + 0	..	..	Rising then steady
2 = + —	..	..	Rising then falling
3 = — + or 0 +	..	..	Falling or steady then rising
4 = unsteady +	Unsteady but rising	} The barometer is now lower than three hours ago.
5 = —	..	..	Falling
6 = — 0	..	..	Falling then steady
7 = — +	..	..	Falling then rising
8 = 0 — or + —	..	..	Steady or rising then falling
9 = unsteady —	Unsteady but falling	

CODE II (a).

Amount and characteristic of Barometric Tendency expressed by a single figure (K').

Code figure.		Change in last three hours in millibars.
0 Barometer steady	.. ..	$\frac{1}{2}$
1 Barometer rising slowly	.. ..	1—1 $\frac{1}{2}$
2 Barometer rising	.. ..	2—3 $\frac{1}{2}$
3 Barometer rising quickly	.. ..	4—6
4 Barometer rising very rapidly	.. ..	more than 6
5 Barometer falling slowly	.. ..	1—1 $\frac{1}{2}$
6 Barometer falling	.. ..	2—3 $\frac{1}{2}$
7 Barometer falling quickly	.. ..	4—6
8 Barometer falling very rapidly	.. ..	more than 6

CODE III.

Past Weather in interval since last report (W).

	Code figure	
Without precipitation.	{ 0 —	Fair or fine
	{ 1 —	Cloudy
	{ 2 —	Overcast continuously
	{ 3 —	Fog or mist
	{ 4 —	Thick fog
Precipitation.	{ 5 —	Passing showers
	{ 6 —	Rain or drizzle
	{ 7 —	Snow or sleet
	{ 8 —	Hail or rain and hail
	{ 9 —	Thunderstorm

CODE IV.

*Horizontal Visibility (V) and (V_s).*Code
figure.

- 0 = Objects not visible at 50 metres (55 yards).
 1 = Objects not visible at 200 metres (220 yards).
 2 = Objects not visible at 500 metres (550 yards).
 3 = Objects not visible at 1,000 metres (1,100 yards).
 4 = Objects not visible at 2,000 metres (1 $\frac{1}{4}$ miles).
 5 = Objects not visible at 4,000 metres (2 $\frac{1}{2}$ miles).
 6 = Objects not visible at 10,000 metres (6 $\frac{1}{4}$ miles).
 7 = Objects not visible at 20,000 metres (12 $\frac{1}{2}$ miles).
 8 = Objects not visible at 50,000 metres (31 $\frac{1}{4}$ miles).
 9 = Objects visible at 50,000 metres or more.

CODE IV (a).

*Horizontal Visibility from Ships at Sea (v).*Code
figure.

- 0 = Dense fog, objects not visible at 50 yards.
 1 = Thick fog, objects not visible at 1 cable.
 2 = Fog, objects not visible at 2 cables.
 3 = Moderate fog, objects not visible at $\frac{1}{2}$ mile (nautical).
 4 = Thin fog or mist, objects not visible at 1 mile (nautical).
 5 = Visibility poor, objects not visible at 2 miles (nautical).
 6 = Visibility moderate, objects not visible at 5 miles (nautical).
 7 = Visibility good, objects not visible at 10 miles (nautical).
 8 = Visibility very good, objects not visible at 30 miles (nautical).
 9 = Visibility excellent, objects visible more than 30 miles (nautical).

CODE V.

Relative Humidity (H).

Code figure.

0	.. .. .	95 to 100 per cent.
9	.. .. .	90 to 94 per cent.
8	.. .. .	80 to 89 per cent.
7	.. .. .	70 to 79 per cent.
6	.. .. .	60 to 69 per cent.
5	.. .. .	50 to 59 per cent.
4	.. .. .	40 to 49 per cent.
3	.. .. .	30 to 39 per cent.
2	.. .. .	20 to 29 per cent.
1	.. .. .	10 to 19 per cent.

CODE VI.

Cloud Form (A, a, C, C₁ Ca).

Code figure.

1	..	Cirrus	.. .. .	Ci.
2	..	Cirro-Stratus	.. .. .	Ci. St.
3	..	Cirro-Cumulus	.. .. .	Ci. Cu.
4	..	Alto-Cumulus	.. .. .	A. Cu.
5	..	Alto-Stratus	.. .. .	A. St.
6	..	Strato-Cumulus	.. .. .	St. Cu.
7	..	Nimbus	.. .. .	Nb.
8	..	Cumulus or Fracto-Cumulus	.. .. .	Cu. or Fr. Cu.
9	..	Cumulo-Nimbus	.. .. .	Cu. Nb.
0	..	Stratus or Fracto-Stratus	.. .. .	St. or Fr. St.

CODE VII.

Height of Base of Lowest Cloud present (h).

Code figure.					Metres.	Feet.
0	..	..	..	..	0 to 50	0 to 150
1	..	..	..	..	50 to 100	150 to 300
2	..	..	..	..	100 to 200	300 to 600
3	..	..	..	..	200 to 300	600 to 1000
4	..	..	..	..	300 to 600	1000 to 2000
5	..	..	..	..	600 to 1000	2000 to 3000
6	..	..	..	..	1000 to 1500	3000 to 5000
7	..	..	..	..	1500 to 2000	5000 to 6500
8	..	..	..	..	2000 to 2500	6500 to 8000
9	..	..	..	..	No low cloud	No low cloud

CODE VIII.

Amount of Rainfall (RR).

This is expressed in whole millimetres with the following exceptions :—
Specification of certain meanings.

Code figure.					Meaning.
91	..	..	..	..	0.1 mm.
92	..	..	..	..	0.2 mm.
93	..	..	..	..	0.3 mm.
94	..	..	..	..	0.4 mm.
95	..	..	..	..	0.5 mm.
96	..	..	..	..	0.6 mm.
97	..	..	..	..	Some rain but not measurable.
98	..	..	..	..	More than 90 mm.
99	..	..	..	..	Measurement impossible or unreliable.

CODE VIII (a).

Amount of Rainfall during preceding 24 hours (R).

Code figure.					
0	..	..	..	..	No rain.
1	..	..	..	..	Trace or 0.1 mm.
2	..	..	..	..	0.2 to 2 mm.
3	..	..	..	..	3 to 5 mm.
4	..	..	..	..	6 to 10 mm.
5	..	..	..	..	11 to 15 mm.
6	..	..	..	..	16 to 20 mm.
7	..	..	..	..	21 to 30 mm.
8	..	..	..	..	31 to 50 mm.
9	..	..	..	..	above 50 mm.

CODE IX.

State of Sea and Swell (S).

Code figure.					
0	..	..	..	..	No swell
1	..	..	..	..	Moderate swell
2	..	..	..	..	Heavy swell
3	..	..	..	..	No swell
4	..	..	..	..	Moderate swell
5	..	..	..	..	Heavy swell
6	..	..	..	..	Rather rough sea.
7	..	..	..	..	Rough sea.
8	..	..	..	..	Very rough sea.
9	..	..	..	..	Mountainous sea.

Calm or slight sea.

Moderate sea.

CODE IX (a).

Characteristic of Swell in the Open Sea (K).

Code figure.						
0	No or slight swell	} and sea smooth to moderate.
1	..	..	..	..	Moderate swell
2	..	..	..	..	Heavy swell
3	..	..	..	..	Long low swell
4	..	..	..	..	Confused swell
5	No or slight swell	} and sea rough.
6	..	..	..	..	Moderate swell
7	..	..	..	..	Heavy swell
8	..	..	..	..	Long low swell
9	..	..	..	..	Confused swell

CODE X.

Time of Commencement of Precipitation (r).

Code figure.					
0	..	..	..	..	No rain.
1	..	..	..	..	0 to 1 hour before time of observation.
2	..	..	..	..	1 to 2 hours before time of observation.
3	..	..	..	..	2 to 3 hours before time of observation.
4	..	..	..	..	3 to 4 hours before time of observation.
5	..	..	..	..	4 to 5 hours before time of observation.
6	..	..	..	..	5 to 6 hours before time of observation.
7	..	..	..	..	6 to 8 hours before time of observation.
8	..	..	..	..	8 to 10 hours before time of observation.
9	..	..	..	..	above 10 hours before time of observation.
-	..	..	..	..	No observation.

CODE XI.

Height at which Upper Wind is reported (h_1).

The heights at which the upper wind is reported are the *three* heights selected from the following list which give the best representation of the result of the pilot-balloon ascent.

Code figure.					metres.	feet (used in British reports).
1	..	..	..	..	200	or 1,000
2	..	..	..	..	500	or 2,000
3	..	..	..	..	1,000	or 3,000
4	..	..	..	..	1,500	or 5,000
5	..	..	..	..	2,000	or 7,000
6	..	..	..	..	3,000	or 10,000
7	..	..	..	..	4,000	or 13,000
8	..	..	..	..	5,000	or 16,000
9	..	..	..	..	6,000	or 20,000

CODE XII.

Heights at which Upper Air Temperature and Humidity are reported (H_1)
(no code figure telegraphed).

200 metres	} above ground.
500 metres	
1,000 metres	
1,500 metres	} above mean sea level.
2,000 metres	
2,500 metres	
3,000 metres	
4,000 metres	
5,000 metres	
6,000 metres	

CODE XIII.

Quarter of Globe (Q).

Code figure.	Latitude.	Longitude.	
1	N.	W.	} Barometer in millibars.
2	N.	E.	
3	S.	W.	
4	S.	E.	
5	N.	W.	} Barometer in millimetres.
6	N.	E.	
7	S.	W.	
8	S.	E.	

CODE XIV.

Approximate Speed of Low Cloud (F₁).

Code figure.	Corresponding Mean Speed.		Limits of Speed.	
	If in km. per hour.	If in miles per hour.	If in km. per hour.	If in miles per hour.
0	Less than 5	Less than 5	0-7	0-4
1	15	10	8-22	5-14
2	30	20	23-37	15-24
3	45	30	38-52	25-34
4	60	40	53-67	35-44
5	75	50	68-82	45-54
6	90	60	83-97	55-64
7	105	70	98-112	65-74
8	120	80	113-127	75-84
9	135	90	128-142	85-94

THE OLD INTERNATIONAL CODE.

I.—THE SYMBOLS AND THEIR MEANINGS.

BBB is the corrected barometric pressure in tenths of mm. (the first figure 7 is omitted).

.DD is direction of the wind (true not magnetic) on scale (01-32), where 02 = NNE, 04 = NE, etc. 32 = N., 00 = calm.

F is strength of the wind on Beaufort Scale (0-12) (for numbers above 9, the figure 9 is reported and actual force given in words at end).

W is state of the sky (*see* Code I, below).

TT is temperature in whole degrees Centigrade. 50 is added to the number when the temperature is below zero.

C is direction of motion of upper-clouds (*see* Code II, p. below).

β is characteristic of barometric tendency (*see* Code III, p. below).

bb is the amount of the tendency in tenths of mm.; 50 is added to the wind direction number (DD) if the tendency is negative.

RR is rainfall in mm., in past 24 hours (*see* Code VI, p. below, for special meanings).

MM is maximum temperature	{	From 7 h. of the preceding day
mm is minimum temperature		to 7 h. of the day of observation.
		These are in whole degrees Centigrade, 50 being added if the temperature is below zero.

u is sea disturbance (*see* Code IV, p. below).

W' is characteristic of past weather sent at the end of the second group in place of C in 18 h. messages (*see* Code V, p. below).

(InIn is the index number of the reporting station.)

II.—SYMBOLIC FORM OF MESSAGES.

Observations at 1800 G.M.T.—BBBDD FWTTW'.

Observations at 0700 G.M.T.—BBBDD FW TTC β bbRR MMmmu.

III.—SPECIFICATION OF THE SCALES.

CODE I.

State of the Sky (W).

Code figure.

- 0 Sky cloudless.
- 1 Sky $\frac{1}{4}$ covered.
- 2 Sky $\frac{1}{2}$ covered.
- 3 Sky $\frac{3}{4}$ covered.
- 4 Sky overcast.

Code figure.

- 5 Rain.
- 6 Snow
- 7 Mist.
- 8 Fog.
- 9 Thunderstorm.

CODE II.

Direction of Upper (Cirro-) Cloud (C).

Code figure.

- 0 Clouds with no appreciable movement.
- 1 Clouds from N.E.
- 2 Clouds from E.
- 3 Clouds from S.E.
- 4 Clouds from S.

Code figure.

- 5 Clouds from S.W.
- 6 Clouds from W.
- 7 Clouds from N.W.
- 8 Clouds from N.
- 9 No observation.

CODE III.

Characteristic of Tendency (β).

Figures characterising the change of pressure during the 3 hours preceding the observation.

Code figure.

- 0 Barometer steady.
- 1 Barometer unsteady.
- 2 Barometer rising.
- 3 Barometer falling.
- 4 Barometer falling then rising.
- 5 Barometer steady then rising.

Code figure.

- 6 Barometer steady then falling.
- 7 Barometer falling then steady.
- 8 Barometer rising then steady or falling.
- 9 Line squall.

CODE IV.

Sea Disturbance (u).

Code figure.

- 0 Sea calm.
- 1 Sea very smooth.
- 2 Sea smooth.
- 3 Sea slight.
- 4 Sea moderate.

Code figure.

- 5 Sea rather rough.
- 6 Sea rough.
- 7 Sea high.
- 8 Sea very high.
- 9 Sea phenomenal.

CODE V.

Characteristic of past Weather (W').

Code figure.

- 0 Mainly fine.
- 1 Fair (high clouds preponderating).
- 2 Mainly overcast (low clouds preponderating).
- 3 Sheet lightning (more than one flash).
- 4 Precipitation, mainly during forenoon, without thunderstorms or with at most one peal of thunder without lightning.
- 5 Precipitation, mainly during afternoon, without thunderstorms or with at most one peal of thunder without lightning.
- 6 Mainly foggy.
- 7 Thunderstorm.
- 8 Passing showers (squally, changeable weather with bright intervals).
- 9 Persistent precipitation (including falls of snow or soft hail of long duration, sky overcast during the intervals).

CODE VI.

Rainfall (RR).

The following code figures are used with a special significance :
Code figures.

- 00 No precipitation.
- 99 Precipitation has occurred, but its amount has not been measured.
- 98 Precipitation exceeding 96 mm.
- 97 "Trace" of precipitation, amount less than 0.5 mm.

Amounts exceeding 96 mm. are reported in full at the end of the message, the figures 98 being inserted in the coded part.

FRENCH METEOROLOGICAL CODE

In the synoptic messages transmitted according to the French Meteorological Code the letter-symbols employed have the same meaning **as in the New International Meteorological Code with the undermentioned exceptions:—**

- A_1 = Nature of clouds lower than 2,500 metres. (See Table A_1 .)
- A_2 = " " higher than 2,500 " (See Table A_2 .)
- bb = Barometric tendency in tenths of millimetres. (The sign is indicated by c.) (See Table 6a.)
- DD = Direction of surface wind (0-32). (See Table 2.)
- dd = Direction of the lower clouds (0-32). (See Table 2.)
- d = Direction of upper clouds (Ci, Ci, Cu, Ci, St1). (See Table 2d.)
- ddff = Sondages : direction of wind (dd) and force (ff).
The groups ddff are reported successively at altitudes of 500, 1,000, 1,500, 2,000, 3,000 and 4,000 metres.
- dd = Direction of the wind (0-32). (See Table 2.)
- ff = Force of the wind in kilometres per hour ; (for forces exceeding 100 kilometres per hour, 50 is added to dd).
- N = Amount of cloudiness. (See Table N.)
- n = Amount of lower clouds (similar to N).
- P = Present weather. (See Table P.)
- P_1 = Past weather (similar to P).
- qq = Ship's course (scale 00-32). (Similar to Table 2).
- r = Time rain finished. (Similar to r New International Code).
- T_1T_1 = Difference between wet and dry bulb thermometer in tenths of a degree.
- w_1w_1 = Weather changes. (See Table w_1w_1 .)

TABLES.

A_1 = Nature of clouds lower than 2,500 metres.

- 0—No low clouds.
- 1—Stratus and/or fracto-stratus.
- 2—Cumulus and/or fracto-cumulus.
- 3—Stratus and cumulus or stratus and strato-cumulus.
- 4—Strato-cumulus.
- 5—Nimbus and cumulus.
- 6—Cumulo-nimbus and cumulus.
- 7—Nimbus and cumulo-nimbus.
- 8—Cumulo-nimbus.
- 9—Nimbus.

A_2 = Nature of clouds higher than 2,500 metres.

- 0—No middle or high clouds.
- 1—Cirrus only.
- 2—Cirro-cumulus only or cirro-cumulus and cirrus.
- 3—Cirro-stratus only or cirro-stratus and cirrus.
- 4—Cirrum and alto-cumulus.
- 5—Cirrum and also stratus.
- 6—Cirrum and alto-cumulus and alto-stratus.
- 7—Alto cumulus only visible.
- 8—Alto-cumulus and alto-stratus.
- 9—Alto-stratus uniformly or only visible.

(The term cirrum includes cirrus, cirro-stratus and cirro-cumulus, or any combination thereof.)

N = Total cloudiness.

- 0—Clear sky.
- 1—Sky nearly clear.
- 2—Sky covered, .1 or .2.
- 3—Sky covered, .3 or .4.
- 4—Sky covered, .5 or .6.
- 5—Sky covered, .7 or .8.
- 6—Sky covered, .9.
- 7—Sky nearly covered.
- 8—Sky entirely covered.
- 9—Observation impossible.

P = Present weather, determining the state of the sky, partially given by N .

- 0—No dangerous weather.
- 1—Continual rain or drizzle.
- 2—Continual snow.
- 3—Showers of rain, or intermittent rain, or hail showers.
- 4—Snow showers.
- 5—Storm (with or without squalls.)
- 6—Squalls (or line squall), or rain and hail, or heavy showers of rain.
- 7—Squalls, surface wind strong or upper wind light.
- 8—Thick fog or mist, visibility less than 1,000 metres.
- 9—Fog or mist, upper air clear.

(Where a double observation represents the state of the weather, the one which is of interest to aviators is given, or else that which denotes the exact state of the sky.)

w_1w_1 = Weather Changes.

w_1w_1	Present Weather.	Changes during preceding 6 hours.
00	Clear sky.	
01	Clear sky.	Alternately very cloudy (Cu-Nb, Fr-Cu, or Fr-Nb), and then clear with high and middle fragmentary clouds.
02	Clear sky, with thin detached Ci.	
03	Idem 02.	Idem 01.

$W_1W_1 =$ WEATHER CHANGES—*continued*.

04	Clear sky, with Fr-St, Fr-Cu, or local detached Ci.	
05	Idem 04.	Idem 01.
06	Sky with Fr-St, Fr-Cu, or local detached Ci-Cu.	
07	Idem 06.	Idem 01.
08	Sky with local serrated Cu, almost Cu clouds gradually increasing flat, or St-Cu.	
09	Idem 08.	Idem 01.
10	Sky with, or without, local Ci-Cu, or veiled with Ci-St.	
11	Idem 10.	Clear sky, except for local detached Ci-Cu.
12	Completely covered with Ci-St (halo) ; local Cu absent, or being reabsorbed.	
13	Idem 12.	Idem 11.
14	Sky with, or without, local Ci-Cu and detached banks of high and middle clouds (A-Cu A-St, or lenticular Ci-St) constantly changing.	
15	Idem 14.	Idem 11.
16	Serrated layer, more or less misty, with A-Cu.	A-Cu increasing with tendency to join.
17	Idem 16.	Idem 14.
18	Sky obscured by St.	
19	Sky obscured by fog or thick mist.	
20	Sky covered with A-St with detached low clouds ; no rain.	
21	Idem 20.	Ci and A-Cu, or A-Cu only.
22	Idem 20.	Ci and A-Cu, with intermittent light rain.
23	Idem 20, with intermittent light rain.	Idem 21.
24	Sky covered with veil of A-St and low clouds, no rain.	
25	Idem 24.	Ci with covering of Ci-St.
26	Idem 20.	Idem 26, with continuous or nearly continuous rain.
27	Sky covered with A-St, lining of low clouds ; continuous or nearly continuous rain.	Idem 24.
28	Sky covered with A-St, lining of low clouds ; continuous or nearly continuous snow.	
29	Sky covered with A-St, lining of low clouds ; continuous or nearly continuous snow.	Idem 24.

W₁W₁ = WEATHER CHANGES—*continued*.

30	Sky cloudy, or very cloudy (large Fr-Cu or Fr-Nb), mist, high fragmentary clouds, no showers.	
31	Idem 30.	Sky covered with A-St; rain or no rain.
32	Sky cloudy (large Fr-Cu or Fr-Nb) with intervals of sky.	
33	Idem 32.	Showers or squalls; then fair.
34	Alternately showery and fair with very cloudy sky (Cu-Nb or Mm-Cu and upper and middle fragmentary clouds).	
35	Idem 34.	Idem 31.
36	Alternately, showers of snow, hail or sleet, then clear; sky very cloudy (Cu-Nb or Mm-Cu and upper and middle fragmentary clouds.)	
37	Idem 36.	Idem 31.
38	Alternately, heavy hail squalls, then clear; sky very cloudy (Cu-Nb or Mm-Cu and high fragmentary clouds).	
39	Idem 38.	Idem 31.
40	Stormy; cloudy to very cloudy; low heavy striped Ci (Ci-Cu A-Cu, partially covered with Ci-St.)	
41	Idem 40.	Clear sky; except detached thin Cu.
42	Stormy sky filled with clouds at different altitudes (particular clouds indicating the presence of A-Cu—castellatus—Mm-Cu).	
43	Sky filled with clouds at different altitudes; threatening; (distant thunder with lightning on the horizon).	
44	Idem 42.	Very cloudy; low heavy Ci, Ci-Cu, A-Cu, partially covered with Ci-St.
45	Sky stormy, or threatening.	
46	Idem 45.	Idem 44.
47	Storm passed (St-Cu or Mm-Cu with intervals of clear sky for 6 hours or more after a stormy sky).	
48	Idem 47.	Stormy sky.

Note.—When any change described above is preceded for 6 hours by fog, mist or St, the same will be indicated by the addition of 50 to the code number signalled.

TABLE 2.—DD or dd.

00 = Calm.	12 = S.E.	24 = West.
02 = N.N.E.	14 = S.S.E.	26 = W.N.W.
04 = N.E.	16 = South.	28 = N.W.
06 = E.N.E.	18 = S.S.W.	30 = N.N.W.
08 = East.	20 = S.W.	32 = North.
10 = E.S.E.	22 = W.S.W.	

The number is increased by 50 in the text of the message if the barometric tendency is negative.

TABLE 2*d*.—d.

0 = Calm.	3 = S.E.	6 = West.	9 = No observation.
1 = N.E.	4 = South.	7 = N.W.	
2 = East.	5 = S.W.	8 = North.	

TABLE 6*a*.—bb (Barometric Tendency).

Variation of the barometer in millimetres and tenths during the three hours preceding the time of observation. If the tendency is negative, 50 is added to the number DD indicating the direction of the wind.

SHIP OBSERVATIONS.

Meteorological observations obtained by ships crossing the North Atlantic are of great importance for the forecasting of weather in Western Europe.

The observations should not be reported by W/T unless they are made at more than 60 miles from the west coast of France.

The International times fixed for these observations should be used whenever possible, viz. : 0100, 0700, 1300, 1800 G.M.T. (civil).

When about to send the meteorological message, the ship should call one of the following French W/T stations :—

Brest-Mengam (FUE), Lorient-Pen Mané (FUN) or Rochefort (FUR). On receiving a reply, transmission takes place in accordance with the customary procedure. If there is no response, the message is sent broadcast.

Ships equipped with continuous wave transmit their observations to Brest-Mengam during one of the undermentioned periods :—

0045-0100	0900-0930	1500-1530	2000-2030
0300-0330	1300-1315	1800-1815	2130-2145

For this purpose Brest-Mengam is called on 2,400 metres (C.W.). The coast station answers on the same wave, but requests the ship to reply on 3,300 metres (C.W.). The subsequent message is sent on 2,400 metres (C.W.), in case of interference, however, 2,250 or 2,550 metres (C.W.) may be employed.

When the ship is between 600 miles and 1,600 miles from Brest, and receives no answer, the message is broadcasted once at two of the intervals (successively) provided for transmission.

Form of Message —

Meteorological observation messages are always preceded by the word "Meteo."

QLLLX jlllx BBDDX FVS₁sX wwGGX Nbqq₁X YYYYYZ

Code.—New International Meteorological, except :—

N = Cloudiness and sign of the tendency.

q₁ = Distance travelled in the three hours preceding the signalled observation in tens of miles (e.g., 27 miles travelled is signalled by 3).

GERMAN METEOROLOGICAL CODE

ALPHABETICAL LIST OF SYMBOLS.

Code.	Meaning.	Section.	Code.	Meaning.	Section.
A	Form of clouds (lower clouds) ..	I	h	Height of clouds	VIII
a	" " (upper clouds) ..	I	K	Ship's course	IX
B	Atmospheric pressure	II	L	"	X
b	Alteration in atmospheric pressure during the 3 hours preceding the observation ..	II	M	Temperature—maximum ..	XI
c	Characteristic of atmospheric pressure during the 3 hours preceding the observation ..	II	m	" minimum ..	XI
D	Direction of the wind	III	N	Amount of sky covered by clouds ..	XII
d	Direction of movement of the clouds	IV	o	Days of the week	XIII
E	Distance travelled by ship during the 3 hours preceding observations in tens of miles ..	V	P	Humidity in percentages ..	XIV
F	Force of the wind and velocity of the wind	VI	Q	Quadrantal for Lat. and Long... ..	XV
f	Velocity of the clouds	VII	R	Rainfall (or snowfall)	XVI
GG	Forecast for ensuing 12 hours ..	VIII	S	State of the sea and swell ..	XVII
H	Heights above sea level		T	Temperature	XVIII
			V	Horizontal visibility	XIX
			W	State of the weather	XX
			xy	Check figures	XXI
			Y	Date	XXI
			Z	Time	XXIII
			φ	Latitude	XXIV
			λ	Longitude	XXIV

SECTION I.

A, a = Form of the Clouds (A = lower clouds, a = upper clouds).

- A, a
- 1 Cirrus.
 - 2 Cirro-stratus.
 - 3 Cirro-cumulus.
 - 4 Alto-cumulus.
 - 5 Alto-stratus.
 - 6 Strato-cumulus.
 - 7 Nimbus.
 - 8 Cumulus or fracto-cumulus.
 - 9 Cumulo-nimbus.
 - 0 Stratus or fracto-stratus.

- A₁
- 0 Cloudless.
 - 1 Fracto-cumulus.
 - 2 Mammato-cumulus.
 - 3 Low-strato-cumulus (below 1,500 metres).
 - 4 High strato-cumulus (above 1,500 metres).
 - 5 Nimbus.
 - 6 Cumulus.
 - 7 Cumulo-nimbus.
 - 8 Stratus.
 - 9 No observation.

- a₂
- 0 Cloudless.
 - 1 Cirrus.
 - 2 Cirro-Stratus.
 - 3 Cirro-cumulus.
 - 4 False cirrus.
 - 5 Weak alto-stratus (sun and moon are visible).
 - 6 Alto-stratus (sun and moon are not visible).
 - 7 Alto-cumulus, low (below 3,000 metres).
 - 8 Alto-cumulus, high (above 3,000 metres).
 - 9 No observation.

SECTION I—*continued*.

- A₃ 0 No low clouds.
 1 Stratus or fracto-stratus or both.
 2 Cumulus or fracto-cumulus or both.
 3 Stratus and cumulus or stratus and strato-cumulus.
 4 Strato-cumulus.
 5 Nimbus and cumulus.
 6 Cumulo-nimbus and cumulus.
 7 Nimbus and cumulo-nimbus.
 8 Cumulo-nimbus.
 9 Nimbus.
- a₃ 0 No high or medium clouds present or observable.
 1 Cirrus.
 2 Cirro-cumulus or cirro-cumulus and cirrus.
 3 Cirro-stratus or cirro-stratus and cirrus.
 4 Cirrus and alto-cumulus.
 5 Cirrus and alto-stratus.
 6 Cirrus and alto-cumulus and alto-stratus.
 7 Alto-cumulus.
 8 Alto-cumulus and alto-stratus.
 9 Alto-stratus.

SECTION II.

B = Atmospheric Pressure.

BBB Atmospheric pressure, reduced to sea-level, 0° and normal gravity, in tenths of millimetres and omitting the initial figure ;

for example, 638 = 763·8 mm.

BB Atmospheric pressure in whole millimetres.

B₁B₁B₁ „ „ „ tenths of a millibar.

B₁B₁ „ „ „ whole millibars.

B₂B₂B₂ „ „ „ inches.

b Alteration of atmospheric pressure in the last 3 hours preceding the observation, in whole millimetres.

bb Alteration of atmospheric pressure in the last 3 hours preceding the observation, in whole and tenths of a millimetre. If falling, 50 will be added to DD.

99 = not observed.

98 = alteration greater than 9·7 mm.

bbb Alteration of atmospheric pressure in the last 3 hours preceding the observation, in whole and tenths of a millimetre.

b₁ Alteration of atmospheric pressure in the last 3 hours preceding the observation, to half-millibars. With alterations 10-19 half-millibars, only the second figure will be reported and 33 will be added to DD ; with alterations 20-29 half-millibars 67 will be added.

b₁b₁ Alteration of atmospheric pressure in the last 3 hours preceding the observation, to half-millibars.

b₂b₂ Alteration of atmospheric pressure in the last 3 hours preceding the observation, in whole and tenths of a millibar.

99 = not observed.

b₃ One figure (unit figure) of the alteration of atmospheric pressure in the last 3 hours preceding the observation, in half-millimetres. With alterations of 10-19 half-millimetres 33 will be added to DD, with 20-29 half-millimetres, 67 will be added.

SECTION II—*continued.*

C = Characteristic of atmospheric pressure in the last 3 hours preceding the observation.

- | | | | |
|----------------|---|--|--|
| c | 0 | Steady (or not observed). | |
| | 1 | Unsteady. | |
| | 2 | Rising. | |
| | 3 | Falling. | |
| | 4 | Falling at first, then rising. | |
| | 5 | Steady at first, then rising. | |
| | 6 | Steady at first, then falling. | |
| | 7 | Falling at first, then steady. | |
| | 8 | Rising at first, then steady or falling. | |
| | 9 | Thunder. | |
| c ₁ | 0 | Steady. | |
| | 1 | Rising at first, then steady | } Alteration in atmospheric pressure positive. |
| | 2 | Rising at first, then falling. | |
| | 3 | Falling or steady at first, then rising. | |
| | 4 | Unsteady, but rising. | } Alteration in atmospheric pressure negative. |
| | 5 | Falling. | |
| | 6 | Falling, then steady. | |
| | 7 | Falling at first, then rising. | |
| | 8 | Rising or steady at first, then falling. | |
| | 9 | Unsteady, but falling. | |
| c ₂ | 0 | No noticeable alteration | < 0.5 mm. |
| | 1 | Falling slowly | 0.5 to 1.4 " |
| | 2 | Falling moderately | 1.5 to 2.4 " |
| | 3 | Falling rapidly | 2.5 to 3.4 " |
| | 4 | Falling very rapidly | > 3.4 " |
| | 5 | Rising slowly | 0.5 to 1.4 " |
| | 6 | Rising moderately | 1.5 to 2.4 " |
| | 7 | Rising rapidly | 2.5 to 3.4 " |
| | 8 | Rising very rapidly | > 3.4 " |
| | 9 | Unsteady or not specified. | |
| c ₃ | 0 | Steady. | |
| | 1 | Steadily rising. | |
| | 2 | Rising at first, then steady. | |
| | 3 | Rising at first, then falling. | |
| | 4 | Falling or steady at first, then rising. | |
| | 5 | Falling steadily. | |
| | 6 | Falling at first, then steady. | |
| | 7 | Falling at first, then rising. | |
| | 8 | Steady or rising at first, then falling. | |
| | 9 | Squally. | |
| c ₄ | 0 | Unaltered | + 0 or 1 half-millibars. |
| | 1 | Slowly rising | + 2 to 3 " |
| | 2 | Rising | + 4 to 7 " |
| | 3 | Rapidly rising | + 8 to 12 " |
| | 4 | Rising very rapidly | more than 12 " |
| | 5 | Falling slowly | - 2 or 3 " |
| | 6 | Falling | - 4 to 7 " |
| | 7 | Falling rapidly | - 8 to 12 " |
| | 8 | Falling very rapidly | more than 12 " |

SECTION II—continued.

(Millimetres)			
0	<0.4 mm. rising or falling (steadily).	c ₅ 0	0 to 0.5 mm., rising.
1	0.8 to 1.2 mm., rising.	1	0.5 to 1.5 " "
2	1.5 to 2.6 " "	2	1.5 to 3.5 " "
3	3.0 to 4.6 " "	3	3.5 to 6 " "
4	Over 4.6 " "	4	More than 6 " "
5	0.8 to 1.2 mm., falling.	5	0 to 1.5 mm., falling.
6	1.5 to 2.6 " "	6	1.5 to 3.5 " "
7	3.0 to 4.6 " "	7	3.5 to 6 " "
8	Over 4.6 " "	8	More than 6 " "

SECTION III.

D = Direction of Wind.

DD 00	Calm	12	S.E.	24	W.
02	N.N.E.	14	S.S.E.	26	W.N.W.
04	N.E.	16	S.	28	N.W.
06	E.N.E.	18	S.S.W.	30	N.N.W.
08	E.	20	S.W.	32	N.
10	E.S.E.	22	W.S.W.		

(For figures other than the above, see under bb, b₁, b₃ or F₁).

D₁D₁ Direction of wind in upper air observations on scale 01—36; degrees reckoned from N, divided by 10 and rounded off to the nearest whole number; 00 = calm.

D ₂ a	N.N.E.	e	E.S.E.	i	S.S.W.	m	W.N.W.
b	N.E.	f	S.E.	j	S.W.	n	N.W.
c	E.N.E.	g	S.S.E.	k	W.S.W.	o	N.N.W.
d	East.	h	South.	l	West.	p	North.

D ₃ 0	Calm.	D ₃ 5	From S.
1	From N.	6	" S.W.
2	" N.E.	7	" W.
3	" E.	8	" N.W.
4	" S.E.		

D ₄ 0	Calm.	D ₄ 5	S.W.
1	N.E.	6	W.
2	E.	7	N.W.
3	S.E.	8	N.
4	S.		

SECTION IV.

d = Direction of Movement of the Clouds.

d 0	No perceptible movement.	d 5	From S.W.
1	From N.E.	6	" W.
2	" E.	7	" N.W.
3	" S.E.	8	" N.
4	" S.	9	No direction reported.

d₁d₁ Direction from which the clouds are coming according to scale 0-32 (see DD).

d₂d₂ Direction from which the clouds are coming according to scale 01 to 36 (see D₁D₁).

d ₃ 0	Cloudless.	d ₃ 5	Clouds from S.W.
1	Clouds from N.	6	" " S.W.
2	" " N.E.	7	" " W.
3	" " E.	8	" " N.W.
4	" " S.E.	9	No observations.

SECTION V.

E = Distance travelled by the ship in the last 3 hours preceding the observation, in tens of miles.

SECTION VI.

F = Force of wind and velocity of wind.

F Force of the wind according to Beaufort scale (*q.v.*).
Forces over 9 will be indicated by 9 also ; the force being added at the end in words.

F₁ One figure giving the velocity of wind in metres per second.
With velocities of wind of 10 to 19 metres per sec., the number 33 will be added to the figures for DD ; with velocities of 20 to 29, the number 67 will be added ; for example :—
578 = W 18, 979 = N.N.W. 21. Forces of wind over 30 will be given in words ; for example : 970 36 metres per sec. = N.N.W. 36. 000 = calm.

F₁F₁ = Velocity of Wind in metres per second.

F₃F₃ " " " kilometres per hour.

F₄F₄ " " " sea miles per hour.

F₅ Maximum force of wind since the last observation.

3	Beaufort scale 0-3.	8	Beaufort scale 8.
4	" " 4.	9	" " 9.
5	" " 5.	0	" " 10.
6	" " 6.	1	" " 11.
7	" " 7.	2	" " 12.

SECTION VII.

f = Velocity of movement of the clouds.

ff Relative velocity of the movement of the clouds from nephoscope observations.

The actual velocity is calculated from the equation :

$$v = \frac{h}{1000} \cdot ff \text{ (h = height of clouds).}$$

f₁ Velocity of movement of the clouds } = $\frac{\text{Angular Velocity of the clouds}}{\text{Height.}}$

f₂ See Code XIV of the International Meteorological Code.

f₃ Velocity of movement of low clouds.

0	No observation.	4	12-16 m. per sec.	7	24-28 m. per sec.
1	0- 4 m. per sec.	5	16-20 " "	8	28-32 " "
2	4- 8 " "	6	20-24 " "	9	Over 32 " "
3	8-12 " "				

SECTION VIIa.

GG = Forecast for the ensuing 12 hours.

00	Fine, clear weather.	51	Showers.
06	Fine weather with cloud.	54	Hail.
18	Cloudy.	81	Rain.
34	Cold, frost.	90	Snow.
44	High wind.	93	Stormy, unsettled weather.

SECTION VIII.

H = Heights above sea level.

HH Heights in hectometres above sea level : oo = ground value.

H ₁	0	Height 0 metres.	Height 7,000 metres.	Height 17,000 metres.
	1	200 „	8,000 „	18,000 „
	2	500 „	9,000 „	19,000 „
	3	1,000 „	10,000 „	20,000 „
	4	1,500 „	11,000 „	21,000 „
	5	2,000 „	12,000 „	22,000 „
	6	3,000 „	13,000 „	23,000 „
	7	4,000 „	14,000 „	24,000 „
	8	5,000 „	15,000 „	25,000 „
	9	6,000 „	16,000 „	26,000 „

h = Heights of clouds, lower cloud limits.

h	0	0-50 metres.	5	600-1,000 metres.
	1	50-100 „	6	1,000-1,500 „
	2	100-200 „	7	1,500-2,000 „
	3	200-300 „	8	2,000-2,500 „
	4	300-600 „	9	No low clouds.

SECTION IX.

K = Ship's course.

KK Course of the ship. Code similar to DD on scale 0-32.

K₁ Course of the ship.

1	N.E.	4	S.	7	N.W.
2	E.	5	S.W.	8	N.
3	S.E.	6	W.		

K₂ Ship's course (scale 00-32).

SECTION X.

L = Not allotted.

SECTION XI.

M, m = Maximum and minimum temperature.

MM Maximum } Temperature of the past 24 hours in whole degrees
mm Minimum } centigrade.
50 is added to temperatures below zero.

M₁M₁ = Maximum temperature from 8h a.m. to 7h p.m. in whole degrees Fahrenheit.

m₁m₁ = Minimum temperature from 7h p.m. to 8h a.m. in whole degrees Fahrenheit.

M₂M₂ = Maximum temperature from 8h a.m. to 7h p.m. in whole degrees centigrade.

m₂m₂ = Minimum temperature from 7h p.m. to 8h a.m. in whole degrees centigrade.

m₃m₃m₃ = Surface minimum in tenths of a degree centigrade.

m₄m₄ = Surface minimum in whole degrees Fahrenheit.

SECTION XII.

N = Amount of Sky covered by clouds.

0 = Cloudless.	4 = .4 covered.	8 = .8 covered.
1 = 1 covered.	5 = .5 "	9 = .9 "
2 = 2 "	6 = .6 "	
3 = 3 "	7 = .7 "	

N Total amount of sky covered by clouds reported as 0 can either indicate "cloudless" or "totally covered." The signification "cloudless" is to be accepted only when $w_1w_1 = 00$ to 09 and the first four figures of the fourth group are 0000. If w_1w_1 reports 10 to 19 and "N" = 0, then "totally covered" is to be accepted.

N_1 Amount of sky covered by low clouds similar to code N.

N_2 Amount of sky covered by clouds.

0 Cloudless.	Alteration in atmospheric pressure positive.	5 Cloudless.	Alteration in atmospheric pressure negative.
1 $\frac{1}{4}$ covered.		6 $\frac{1}{4}$ covered.	
2 $\frac{2}{4}$ "		7 $\frac{2}{4}$ "	
3 $\frac{3}{4}$ "		8 $\frac{3}{4}$ "	
4 Entirely covered.		9 Entirely covered	

N_3 Amount of sky covered by clouds on the horizon.

0 Whole horizon cloudless.	6 Clouds on horizon up to the 2nd quadrant.
1 Clouds on North horizon.	7 Clouds on horizon up to the 3rd quadrant.
2 Clouds on East horizon.	8 Clouds on horizon up to the 4th quadrant.
3 Clouds on South horizon.	9 Horizon entirely clouded.
4 Clouds on West horizon.	
5 Clouds on horizon up to the 1st quadrant.	

N_4 Amount of sky covered by clouds.

0 Cloudless.	5 .7-.8 covered.
1 Sky nearly clear of clouds, traces of clouds or isolated clouds.	6 .9 "
2 .1-.2 covered.	7 Covered, with a few gaps in the clouds.
3 .3-.4 "	8 Entirely covered.
4 .5-.6 "	9 No observation possible.

N_5 Amount of sky covered with low clouds, similar to code N_4 .

SECTION XIII.

0 = Days of the week.

1 Sunday.	3 Tuesday.	5 Thursday.	7 Saturday.
2 Monday.	4 Wednesday.	6 Friday.	

SECTION XIV.

P = Humidity.

P 0 95-100 per cent.	5 50-59 per cent.
9 90- 94 "	4 40-49 "
8 80- 89 "	3 30-39 "
7 70- 79 "	2 20-29 "
6 60- 69 "	1 10-19 "

P_1P_1 = Relative humidity in per cent.

98 = 100 per cent.

99 = cannot be given.

SECTION XV.

Q = Quarter of the globe in which ship is situated.

	Lat.	Long.		Lat.	Long.
1	N.	W.	3	S.	W.
2	N.	E.	4	S.	E.

	Lat.	Long.	
Q ₁ 1	N.	W.	} Barometer in millibars.
2	N.	E.	
3	S.	W.	
4	S.	E.	
5	N.	W.	} Barometer in millimetres
6	N.	E.	
7	S.	W.	
8	S.	E.	

SECTION XVI.

R = Amount of rainfall (or snowfall).

RR Amount of rain or snow, which has fallen in the past 24 hours (from morning to morning) in whole millimetres.

00 = No precipitation.

98 = More than 96 mm.

97 = Less than 0.5 mm.

99 = fallen, but not measurable.

In cases where more than 96 mm. are measured, 98 is given and at the end the amount of precipitation is added as supplementary.

R₁R₁ Amount of precipitation since the last observation in whole millimetres.

91	0.1 mm.	} 0.7, 0.8, 0.9 = 1 mm.
92	0.2 "	
93	0.3 "	
94	0.4 "	
95	0.5 "	
96	0.6 "	

97 Some precipitation, but not measurable.

98 Precipitation more than 90 mm.

99 Measurement unreliable.

R₂ Amount of rainfall or snow, which has fallen in the last 24 hours.

0	No precipitation.	5	10-15 mm.
1	Less than 0.2 mm.	6	15-20 "
2	0.2- 2 mm.	7	20-30 "
3	2- 5 "	8	30-50 "
4	5-10 "	8	30-50 "
		9	Above 50 mm.

SECTION XVII.

S = State of sea and swell.

S State of sea.

0	Smooth.	4	Moderate swell.	8	Very high.
1	Very calm.	5	Rather rough sea.	9	Extremely high.
2	Calm.	6	Rough.		
3	Slight swell	7	High.		

SECTION XVII.—*continued.*

S ₁	0	No swell.	}	Calm or slight sea.
	1	Moderate swell		
	2	Heavy "		
	3	No "	}	Moderate sea.
	4	Moderate "		
	5	Heavy "		
	6	Rough sea.		
	7	High sea.		
	8	Very high sea.		
	9	Extremely high sea.		
S ₂	0	No, or slight swell.	}	Sea smooth or moderate swell.
	1	Moderate swell.		
	2	Heavy "		
	3	Long, low "		
	4	Confused "		
	5	No, or slight "	}	Sea rough.
	6	Moderate "		
	7	Heavy "		
	8	Long, low "		
	9	Confused "		

s Direction from which the swell comes.

s	0	No swell.		
	1	Swell from N.E.	5	Swell from S.W.
	2	" " E.	6	" " W.
	3	" " S.E.	7	" " N.W.
	4	" " S.	8	" " North.

S₁S₁ Direction of sea, scale 0-32.

SECTION XVIII.

T = Temperature.

TT Temperature in whole degrees centigrade. With temperatures below zero 50 is added to the reading, for example:—
— 14° = 64.

The following rule applies to temperatures in the vicinity of the zero point:—

From — 1·5 to 0·6 = 51.
 " — 0·5 to 0·1 = 50.
 " — 0·0 to + 0·4 = 00.
 " + 0·5 to + 1·4 = 01.

TTT Temperature in tenths of degrees centigrade + 500 = negative temperatures.

T₁T₁ Temperature in whole degrees Fahrenheit.

T₂T₂ Temperature of water in whole degrees centigrade.

T₂T₂T₂ Temperature of water in tenths of degrees centigrade.

T₃T₃ Temperature of water in whole degrees Fahrenheit.

T₄T₄ Difference between the observations of the dry and wet thermometers in tenths of degrees centigrade.

T₅T₅ Increase in temperature at an "inversion" in whole degrees centigrade.

SECTION XIX.

V = Horizontal visibility.

- V 0 Objects not visible at 50 metres.
- | | | | | | |
|---|---|------------|---------------------|--------------------|-------------|
| 1 | " | visible at | 50 metres | but not visible at | 200 metres. |
| 2 | " | " | 200 | " | " |
| 3 | " | " | 500 | " | 1,000 |
| 4 | " | " | 1,000 | " | 2,000 |
| 5 | " | " | 2,000 | " | 4,000 |
| 6 | " | " | 4,000 | " | 10,000 |
| 7 | " | " | 10,000 | " | 20,000 |
| 8 | " | " | 20,000 | " | 50,000 |
| 9 | " | " | over 50,000 metres. | | |
- V₁ Visibility at sea.
- | | | | | |
|---|--|----------|------------------------|------------|
| 0 | Dense fog | .. .. | objects not visible at | 50 metres. |
| 1 | Thick fog | .. .. | " | 1 cable. |
| 2 | Fog | .. .. | " | 2 cables. |
| 3 | Moderate fog | .. .. | " | 5 " |
| 4 | Thin fog or thick mist | .. .. | " | 1 mile. |
| 5 | Mist | .. .. | " | 2 miles. |
| 6 | Horizon not visible | .. .. | " | 5 " |
| 7 | " just visible | .. .. | " | 10 " |
| 8 | Horizon well defined but visibility not unusually good | .. .. | " | 30 " |
| 9 | Objects visible above | 30 miles | | |

SECTION XX.

W = State of the weather.

- W State of the weather during the past 24 hours.
- | | | | |
|---|------------------------------------|---|---|
| 0 | Warm. | } | Less than 0.4 mm. rainfall in 24 hours. |
| 1 | Fairly warm. | | |
| 2 | Cloudy generally. | | |
| 3 | Lightning (more than one flash). | | |
| 4 | Rain in the forenoon principally. | } | More than 0.4 mm. rainfall in 24 hours. |
| 5 | Rain in the afternoon principally. | | |
| 6 | Rain at night principally. | | |
| 7 | Thunderstorms. | | |
| 8 | Showers. | | |
| 9 | Continuous rain = rain on land. | | |
- W₁ State of the weather between the morning and evening observations as for W ; except 6 = foggy generally.
- W₂ State of the weather between the morning and evening observations as for W ; except
- | | |
|---|---------------------|
| 4 | = less rainfall. |
| 5 | = heavier rainfall. |
| 6 | = heavier snow. |
- W₃ State of the weather since the last observation.
- | | | | |
|---|--|---|------------------------|
| 0 | Cloudless to half covered (with clouds). | } | Without precipitation. |
| 1 | Cloudy. | | |
| 2 | Continuously overcast. | | |
| 3 | Mist or fog. | | |
| 4 | Thick fog. | | |

SECTION XX.—*continued.*

- | | | | |
|---|-------------------------|---|----------------|
| 5 | Passing showers. | } | Precipitation. |
| 6 | Rain or drizzle. | | |
| 7 | Snow or sleet. | | |
| 8 | Hail, or rain and hail. | | |
| 9 | Thunder. | | |

W₄W₄ Weather during the 2 hours preceding the observation :—

- | | | | |
|----|--|---|--|
| 00 | Cloudless. | | |
| 01 | Cloudless to half covered, medium and high clouds. | | |
| 02 | " " " low clouds. | | |
| 03 | " " " various clouds. | | |
| 04 | Half to entirely covered, medium and high clouds. | | |
| 05 | " " " low clouds. | | |
| 06 | " " " various clouds. | | |
| 07 | Almost entirely covered with medium and high clouds. | | |
| 08 | " " " low clouds. | | |
| 09 | " " " various clouds. | | |
| 10 | Almost covered, medium and low clouds. | | |
| 11 | " " low clouds. | | |
| 12 | " " different clouds. | | |
| 13 | Overcast with low clouds. | | |
| 14 | Alternately cloudless and covered. | | |
| 15 | Covered, and fog or mist, strength 1. | } | Fog,
but
without
precipitation. |
| 16 | " " " " 2. | | |
| 17 | " " strength 3. | | |
| 18 | " " " 4 or 5. | | |
| 19 | " " " 6-8. | | |
| 20 | Mist, strength 1. | | |
| 21 | " " 2. | | |
| 22 | Fog " 3. | | |
| 23 | " " 4 or 5. | | |
| 24 | " " 6-8. | | |
| 25 | Wet fog " 1. | | |
| 26 | " " 2. | | |
| 27 | " " 3. | | |
| 28 | " " 4 or 5. | | |
| 29 | " " 6-8. | | |
| 30 | Damp air. | | |

- | | | | |
|----|---------------------------------|---|--|
| 31 | Extraordinarily clear. | } | Exceptionally
clear,
without
precipitation. |
| 32 | Fine mist. | | |
| 33 | Dew. | | |
| 34 | Hoar frost. | | |
| 35 | Raw hoar-frost. | | |
| 36 | Light, smooth ice. | | |
| 37 | Thick (heavy) ice. | | |
| 38 | Ring round the sun. | | |
| 39 | " " moon. | | |
| 40 | Halo round the sun. | | |
| 41 | " " moon. | | |
| 42 | Aurora Borealis. | | |
| 43 | Squally. | | |
| 44 | Stormy. | | |
| 45 | Heavy atmosphere. | | |
| 46 | Unsettled, threatening thunder. | | |
| 47 | Thunder. | | |
| 48 | Lightning. | | |
| 49 | Thunder and lightning. | | |

SECTION XX.—*continued.*

50	Light showers.	}	Precipitation in showers.
51	Moderate „		
52	Heavy „		
53	Light showers, hail or sleet.		
54	Moderate „ „ „		
55	Heavy „ „ „		
56	Light showers of sleet.		
57	Moderate „ „	}	Snow.
58	Heavy „ „		
59	Light snow showers.		
60	Moderate „ „	}	Only occasional precipitation.
61	Heavy „ „		
62	Fine drizzle		
63	Moderate „		
64	Heavy „		
65	Light rain.		
66	Moderate rain		
67	Heavy „		
68	Light rain and hail.		
69	Moderate rain and hail.		
70	Heavy „ „		
71	Light fall of sleet.		
72	Moderate fall of sleet.		
73	Heavy „ „		
74	Light fall of snow.		
75	Moderate fall of snow.		
76	Heavy „ „		
77	Continuous light drizzle	}	Drizzle.
78	„ moderate drizzle.		
79	„ heavy „		
80	Light rain.	}	Rain.
81	Moderate rain.		
82	Heavy „		
83	Light rain and hail.	}	Rain and hail.
84	Moderate „ „		
85	Continuous heavy rain and hail.	}	Snow.
86	„ light sleet.		
87	„ moderate sleet.		
88	„ heavy „	}	Snowfall.
89	„ light snowfall.		
90	„ moderate snowfall.		
91	„ heavy „	}	Thunder.
92	Light thunder without hail.		
93	Moderate „ „ „		
94	Heavy „ „ „		
95	Light „ with „		
96	Moderate „ „ „		
97	Heavy „ „ „		

W₅ Weather since the last observation.

0	Cloudless.	4	Overcast.	8	Fog.
1	Fair.	5	Rain.	9	Thunder.
2	Half-covered.	6	Snow.		
3	Cloudy.	7	Mist.		

SECTION XX.—*continued.*

W₆ Weather since the last observation.

- 0 Cloudless to half-covered.
- 1 Half to entirely covered.
- 2 Foggy.
- 3 Precipitation in showers.
- 4 Drizzle.
- 5 Rain.
- 6 Snow, or snow and hail.
- 7 Sleet, or rain and snow.
- 8 Hail, or rain and hail.
- 9 Thunder.

W₇W₇ (See Code w₁w₁ in French Meteorological Code).

w Weather at the time of observation.

0	Cloudless.	4	Overcast.	8	Fog.
1	$\frac{1}{4}$ covered.	5	Rain.	9	Thunderstorm.
2	$\frac{1}{2}$ „	6	Snow.		
3	$\frac{3}{4}$ „	7	Mist.		

w₁w₁ (See Code I (ww) International Meteorological Code).

Note.—The particulars contained in the figures 05-09 and 15-19 regarding the course of the weather refer to the hour before the observation.

w₂w₂ The same as W₄W₄ (*q.v.*).

w₃ Letters indicating the weather at the time of observation according to the Beaufort notation (*q.v.*).

The same letter given twice indicates that the phase of weather is lasting, for example, rr = continuous rain.

w₄ Character of prevailing weather.

- 0 Cloudless.
- 1 Continuous rain or drizzle.
- 2 Continuous snow.
- 3 Showers or rain locally.
- 4 Snow showers.
- 5 Thunderstorm (with or without hail).
- 6 Squalls, rain and hail or heavy showers of rain.
- 7 Heavy squalls of wind.
- 8 Thick fog (visibility under 1 km.).
- 9 Fog or fog extending upwards.

SECTION XX.—*continued.*

- W₅
- 0 Cloudless to half-covered.
 - 1 Half to entirely covered.
 - 2 Foggy.
 - 3 Precipitation in showers.
 - 4 Drizzling rain.
 - 5 Rain.
 - 6 Snow, or snow and hail.
 - 7 Sleet, or rain and snow.
 - 8 Hail, or rain and hail.
 - 9 Thunderstorm.

W₆ Character of the weather.

SECTION XXI.

x y = Check figures.

x = Check figure = units figure of the cross addition of the 4 group figures.

y₁ = Units figure of the sum of all the first figures of the 7 groups.

y₂ = Units figure of the sum of all the second figures of the 7 groups, etc.

Example :

1	Group	2330	8		
2	„	1398	2+1	9+1	= read 0.
3	„	2647	9		
4	„	2003	5		
5	„	0748	3+4	8+4	= read 2.
6	„	0027	9		
7	„	0407	1		
<hr/>					
8	„	7334	7		
		+ 1 + 4			

SECTION XXII.

Y = Date.

YY Date of the current month.

SECTION XXIII.

Z = Time.

ZZ Time in full hours rounded off from 00 to 23. 00 = midnight Mean European Time.

Z₁Z₁ Time in full hours rounded off from 00 to 23. 00 = midnight Greenwich Mean Time (civil).

Z₂ Time denoting the beginning of precipitation.

- 0 No rain.
- 1 0-1 hour before the observation.
- 2 1-2 hours „ „ „
- 3 2-3 „ „ „
- 4 3-4 „ „ „
- 5 4-5 „ „ „
- 6 5-6 „ „ „
- 7 6-7 „ „ „
- 8 8-10 „ „ „
- 9 Over 10 „ „ „
- No observation.

SECTION XXIII.—*continued.*

- Z_3 Time, denoting the cessation of precipitation coded the same as Z_2 .
 Z_4Z_4 G.M.T. beginning of precipitation.
 Z_5Z_5 „ cessation of „

SECTION XXIV.

$\phi\phi\phi$ = Geographical latitude in tenths of a degree.

$\lambda\lambda\lambda$ = „ longitude „ „ „

MISSING OBSERVATIONS.

In order that each figure in the foregoing formula may retain its proper place, missing observations will be replaced by the letter X. The same rule applies to a whole group if the necessary particulars are not available.

JAPANESE METEOROLOGICAL CODE

The weather bulletins are divided into two parts, containing the following information :—

Part (1)—Corrected bar. readings (Table I) ; Force of the wind and state of the weather (Table II) ; Direction of the wind (Table III).

This information is sent in the form of one group consisting of three letters and a figure, each group referring to a single ob. stations.

Part (2)—Information concerning high and low pressure areas sent as 20 letters in three groups, one group containing four letters and two groups containing eight letters each. (Three groups in all).

Meaning of letters in Part 2 :

- 1st group : 1st and 2nd letters. (See Table IV).
 „ „ 3rd letter. (See Table V).
 „ „ 4th „ (See Table VI).
 2nd „ 1st, 2nd and 3rd letters. (See Table VII).
 „ „ 4th letter. (See Table VIII).
 „ „ 5th „ (See Table IX).
 „ „ 6th „ (See Table X).
 „ „ 7th „ (See Table XI).
 „ „ 8th „ (See Table XII).

The third group of the 2nd part of the message gives information concerning the “ secondary depression,” exactly similar to that given in the preceding group. This group can be decoded by the same tables as used for group 2.

NOTE.—Information lacking in (1) and (2) is replaced by ciphers to preserve the order.

Table I.—Barometric Pressure.

Tenths	0	1	2	3	4	5	6	7	8	9
Millimetres: 710 and under	AA									
711	AB		AC		AD		AE		AF	
2	AG		AH		AI		AJ		AK	
3	AL		AM		AN		AO		AP	
4	AO		AR		AS		AT		AU	
5	AV		AW		AX		AY		AZ	
6	BA		BB		BC		BD		BE	
7	BF		BG		BH		BI		BJ	
8	BK		BL		BM		BN		BO	
9	BP		BQ		BR		BS		BT	
720	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD
1	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN
2	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX
3	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH
4	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR
5	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB
6	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL
7	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV
8	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF
9	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP
730	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ
1	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ
2	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT
3	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD
4	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN
5	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX
6	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH
7	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR
8	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB
9	JC	JD	JE	JF	JG	JH	JI	JJ	JK	JL
740	JM	JN	JO	JP	JQ	JR	JS	JT	JU	JV
1	JW	JX	JY	JZ	KA	KB	KC	KD	KE	KF
2	KG	KH	KI	KJ	KK	KL	KM	KN	KO	KP
3	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ
4	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ
5	LK	LL	LM	LN	LO	LP	LQ	LR	LS	LT
6	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD
7	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN
8	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX
9	MY	MZ	OA	OB	OC	OD	OE	OF	OG	OH
750	OI	OJ	OK	OL	OM	ON	OP	OQ	OR	OS
1	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC
2	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM
3	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW
4	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG
5	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ
6	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA
7	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK
8	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU
9	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE
760	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO
1	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY
2	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI
3	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS
4	TI	TU	TV	TW	TX	TY	TZ	UA	UB	UC
5	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM
6	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW
7	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG
8	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ
9	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA
770	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK
1	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU
2	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE
3	XF	XG	XH	XI	XJ	XK	XL	XM	XN	XO
4	XP	XQ	XR	XS	XT	XU	XV	XW	XX	XY
5	XZ	YA	YB	YC	YD	YE	YF	YG	YH	YI
6	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS
7	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC
8	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM
9	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW
780	ZX	ZY								
781 and over	ZZ									

Table II.—Force of the Wind and State of the Weather.

Wind Force	0 — 1 (Calm)	2 — 3 (Light winds)	4 — 5 (Fresh winds)	6 — 7 (Strong winds)	8 — 9 (Hurricane)	10 (Typhoon)
Weather :						
Fine, clear ..	A	A	B	C	D	E
Cloud ..	F	F	G	H	I	J
Rain ..	K	K	L	M	N	P
Snow ..	Q	Q	R	S	T	U
Fog ..	V	V	W	X	Y	Z

The Beaufort Scale should be consulted for the correct terms to be applied to the wind forces quoted above.

NOTE.—Although the same signals are given for “Calms” and “Light winds,” the former is always meant when the direction of the wind is omitted.

Table III.—Direction of the Wind.

Code.	Code.
1 N.E.	6 W.
2 E.	7 N.W.
3 S.E.	8 N.
4 S.	0 Calm.
5 S.W.	

Table IV.—Positions of Zones of High and Low Pressure.

Latitude N.		Latitude N.		Longitude E.		Longitude E.	
Code.	°	°	Code.	°	°	Code.	°
A	4	6	N	30	32	A	104
B	6	8	P	32	34	B	106
C	8	10	Q	34	36	C	108
D	10	12	R	36	38	D	110
E	12	14	S	38	40	E	112
F	14	16	T	40	42	F	114
G	16	18	U	42	44	G	116
H	18	20	V	44	46	H	118
I	20	22	W	46	48	I	120
J	22	24	X	48	50	J	122
K	24	26	Y	50	52	K	124
L	26	28	Z	52	54	L	126
M	28	30				M	128
							130
						N	130
						P	132
						Q	134
						R	136
						S	138
						T	140
						U	142
						V	144
						W	146
						X	148
						Y	150
						Z	152
							154

Table V.—Approximate barometric pressure in high pressure zone.

Units	0	1	2	3	4	5	6	7	8	9
Millimetres :										
750 ..										
760 ..	W	V	U	T	S	R	Q	Z	Y	X
770 ..	M	L	K	J	I	H	G	F	E	D
770 ..	C	B	A							

Table VI.—Remarks on high pressure zone.

Code.	Meaning.
A	Barometric pressure within the zone will probably rise gradually.
B	" " " " " fall "
C	High pressure zone will probably move East.
D	" " " " North.
E	" " " " N.E.
F	" " " " S.E.
G	" " " " South.
H	" " appears to be stationary.
I	" " " " moving.
J	" " is the eastern part of a high pressure system over Siberia.
K	" " is the western part of a high pressure zone over the North Pacific.
L	Independent high pressure zone of large extent.
M	" " " " small "
N	High pressure zone disposed to move and will gradually develop.
O	No remarks.
P	High pressure zone disposed to move and will gradually disperse.
Q	" " is eastern part of high pressure system over Siberia and will gradually develop.
R	" " is eastern part of high pressure system over Siberia and will gradually disperse.
S	" " is the western part of high pressure system over the North Pacific and will gradually develop.
T	" " is the western part of high pressure system over the North Pacific and will gradually disperse.
U	There are other high pressure zones over the Pacific area.
V	" " " " " " Continent.
W	There are other high pressure zones.
X	Barometric pressure rising within the high pressure zone ; monsoon strengthening.
Y	" " stationary within the high pressure zone ; monsoon will continue.
Z	" " falling within the high pressure zone ; monsoon will disperse.

Table VII.—Position within 2-degree square of Lat. and Long. as given
in Table IV.

Subdivision				1	2	3	4
Quarter:							
1	..	..	..	A	E	F	G
2	..	..	..	B	I	J	K
3	..	..	..	C	M	N	P
	..	..	..	D	R	S	T

2-degree square :

j	i	f	e
B		A	
k	l	g	h
n	m	s	r
C		D	
p	q	t	u

Table XI.—Description of depression.

Code.	Meaning.	Code.	Meaning.
A	Typhoon.	E	Violent cyclone.
B	Depression developing ; may become a typhoon.	F	Almost a cyclone.
C	Violent typhoon.	G	Depression developing into almost a cyclone.
D	Cyclone.	H	Depression developing ; may become a cyclone.

Table XII.—Supplementary remarks on depressions.

Code	Meaning.								
A	Force weak ; gradually developing.								
B	Force strong ; gradually subsiding.								
C	Developing gradually.								
D	Subsiding gradually.								
E	Developing rapidly.								
F	Subsiding rapidly.								
G	Heavy squalls in vicinity of centre.								
H	Snow storms in vicinity of centre.								
I	Conditions at centre uncertain.								
J	Force weak.								
K	Storm area large.								
L	Snowstorm area large.								
M N O P Q	<table><tr><td rowspan="5">}</td><td rowspan="5">Wind force exceeds 8 (Beaufort)</td><td rowspan="5">{</td><td>300 kilometres from centre.</td></tr><tr><td>400 " "</td></tr><tr><td>500 " "</td></tr><tr><td>600 " "</td></tr><tr><td>700 " "</td></tr></table>	}	Wind force exceeds 8 (Beaufort)	{	300 kilometres from centre.	400 " "	500 " "	600 " "	700 " "
}	Wind force exceeds 8 (Beaufort)				{	300 kilometres from centre.			
						400 " "			
						500 " "			
						600 " "			
		700 " "							
R	Following the cyclone a strong N.W. monsoon will set in over the Japan Sea and the vicinity of Hokkaido.								
S	Following the cyclone heavy snowstorms from the N.W. will set in over the Japan Sea and the vicinity of Hokkaido.								
T	Following the cyclone a strong N. monsoon will set in over the Eastern China Sea.								
U	Following the cyclone a strong N.W. monsoon will set in over the Japan Sea and the vicinity of Hokkaido ; and a strong N. monsoon over the Eastern China Sea.								
V	Cyclone will develop rapidly, accompanied by snowstorms, over the Japan Sea.								
W	Cyclone will develop rapidly, accompanied by snowstorms, over the Yellow Sea.								
X	Cyclone will develop rapidly, accompanied by snowstorms, over the East Sea (To Kai).								

AMERICAN CODE

(1).—*Surface Observations* (2 groups of 5 figures each).

First group of 5 figures—BBBDF.

BBB = barometric pressure in *inches* and hundredths, reduced to sea level (first figure omitted).

D = direction of surface wind.

0 = calm or no movement.

1 = N, 2 = N.E., 3 = E., 4 = S.E., 5 = S., 6 = S.W.,
7 = W., 8 = N.W.

F = force of wind on Beaufort Scale as in N.I.C. (except that forces 10, 11 and 12 are reported simply as 9 without any addition in plain language).

SECOND GROUP OF 5 FIGURES.—W¹bWAC.W¹ = prevailing weather or state of weather at surface at time of ob.

1 = clear (3-tenths or less clouded).

2 = partly cloudy (4 to 7-tenths clouded).

3 = cloudy (8 to 10-tenths clouded).

4 = raining.

5 = snowing.

6 = thunderstorm.

7 = sleeting or hailing.

8 = dense fog.

b = pressure change in hundredths of an inch during 2 hrs preceding ob.

0 = change of less than 0.04 inch.

1 = increase of 0.04 inch

2 = decrease of 0.04 inch.

3 = increase of 0.06 inch.

4 = decrease of 0.06 inch.

5 = increase of 0.08 inch.

6 = decrease of 0.08 inch.

7 = increase of 0.10 inch.

8 = decrease of 0.10 inch.

9 = increase or decrease of 0.12 inches or more (whether it is an increase or decrease can be determined by barometric tendency shown at surrounding stations).

W = amount of clouds—number of tenths of the sky observed.

0 = 1-tenth of sky or less covered.

2 = 2 to 3-tenths of sky covered.

4 = 4 to 5-tenths of sky covered.

6 = 6 to 7-tenths of sky covered.

8 = 8 to 10-tenths of sky covered.

10 = total cloudiness.

A = kinds of clouds.

- 0 = 1-tenth clouds or less (kind not indicated).
- 1 = upper clouds (cirrus, cirro-stratus, cirro-cumulus, alto-cumulus, or alto-stratus), rapidity not indicated.
- 2 = strato-cumulus moving slowly.
- 3 = strato-cumulus moving rapidly.
- 4 = cumulus moving slowly.
- 5 = cumulus moving rapidly.
- 6 = stratus moving slowly.
- 7 = stratus moving rapidly.
- 8 = nimbus or cumulo-nimbus moving slowly.
- 9 = nimbus or cumulo-nimbus moving rapidly.

C = direction of cloud movement.

- | | |
|-----------------------------|-----------------|
| 0 = no movement observable. | 5 = south. |
| 1 = north. | 6 = south-west. |
| 2 = north-east. | 7 = west. |
| 3 = east. | 8 = north-west. |
| 4 = south-east. | |

When both upper and lower clouds are observed, only the amount, kind, and direction of the lower clouds will be sent. In such cases the amount of the upper clouds, if any, can be determined approximately by taking the difference between the tenths of cloudiness interpreted from the figures showing "present weather" and "amount of clouds."

(2).—*Upper Air Observations.* $3D_1V_1D_2V_2$ $4D_3V_3D_4V_4$, etc.

The upper air observations are included in five groups and have identifying numbers 3 to 7, inclusive. The wind direction and force are indicated by the same numerals as for surface wind direction and force.

THIRD GROUP (upper air).—Two levels are included in this group, 250 metres and 500 metres. The first figure (3) identifies the group; the second figure indicates the wind direction at the lower elevation and the third figure the wind force at the lower elevation; the fourth and fifth figures represent, respectively, the wind direction and force at the higher elevation.

FOURTH GROUP (upper air).—Includes 1,000 and 1,500 metre elevations; same arrangement of the five significant figures as in the third group.

FIFTH GROUP (upper air).—Includes 2,000 and 3,000 metre elevations; same arrangement of the five significant figures as in the third group.

SIXTH GROUP (upper air).—Includes 4,000 metre elevation; same arrangement as in the third group, except that there will be only three figures in this group, followed by XX, as elevations in excess of 4,000 metres are reported only in the last group.

LAST GROUP (upper air).—Shows the highest elevation reached. The first figure (7) identifies the group as the one showing the maximum attitude (it may be the fourth, fifth, sixth or seventh group, dependent upon the actual elevation reached); the second and third figures indicate the elevation, in hundreds of metres; the fourth and fifth figures wind direction and velocity, respectively, at the indicated elevation. When the maximum elevation is 9,900 metres or more the figures 99 will be used.

NOTE.—When upper air observations are not possible because of dense fog, the word FOGGY will be sent instead of the third group.

SPECIFICATION OF THE BEAUFORT SCALE WITH

Beaufort Number.	Admiral Beaufort's General Description of Wind.	Admiral Beaufort's Specification, 1805.	Description of Wind.	Mode of Estimating aboard Sailing Vessels.		
0	Calm	Calm	—	—		
1	Light air ..	Just sufficient to give steerage way.	Light breeze	Sufficient wind for working ship.		
2	Slight breeze	That in which a well-man-of-war, with all sail set and "clean full," would go in smooth water from			Moderate breeze	Forces most advantageous for sailing with leading wind and all sail drawing.
3	Gentle breeze						1 to 2 knots.
4	Moderate breeze	3 to 4 knots.	Strong wind	Reduction of sail necessary with leading wind.		
5	Fresh breeze	5 to 6 knots.			Gale forces	Considerable reduction of sail necessary even with wind quatering.
6	Strong breeze	Royals, etc.					Storm forces	Close reefed sail running, or hove to under storm sail.
7	Moderate gale (High Wind)	Single-reefed topsails or top-gallant sails.	Hurricane ..	No sail can stand even when running.		
8	Fresh gale .. (Gale)	Double-reefed topsails, jib, etc.			Hurricane ..	No sail can stand even when running.
9	Strong gale ..	Triple-reefed topsails, etc.					Hurricane ..	No sail can stand even when running.
10	Whole gale ..	Close-reefed topsails and courses.	Hurricane ..	No sail can stand even when running.		
11	Storm ..	That with which she could scarcely bear close-reefed main topsail and reefed foresail.			Hurricane ..	No sail can stand even when running.
12	Hurricane ..	That which would reduce her to storm stay-sails.					Hurricane ..	No sail can stand even when running.
		That which no canvas could withstand.	Hurricane ..	No sail can stand even when running.		
					Hurricane ..	No sail can stand even when running.

* It had been decided that for statistical purposes winds of force less than 8 shall not be counted as gales, and to avoid the ambiguity implied by the use of the term "moderate gale" for force 7 the Beaufort description has been modified by the substitution of the descriptions in italics for forces 7 and 8.

EQUIVALENTS OF THE NUMBERS OF THE SCALE.

Beaufort Number.	Specification of Beaufort Scale.		Mean wind force in lb. per sq. ft. at standard density.	Equivalent velocity in miles per hour.	Limits of Velocity. Miles per hour.
	For Coast Use.	For Use on Land.			
0	Calm	Calm; smoke rises vertically.	0	0	Less than 1
1	Fishing smack * just has steerage way.	Direction of wind shown by smoke drift, but not by wind vanes.	·01	2	1-3
2	Wind fills the sails of smacks, which then move at about 1-2 miles per hour.	Wind felt on face; leaves rustle; ordinary vane moved by wind.	·08	5	4-7
3	Smacks begin to careen, and travel about 3-4 miles per hour.	Leaves and small twigs in constant motion; wind extends light flag.	·28	10	8-12
4	Good working breeze; smacks carry all canvas, with good list.	Raises dust and loose paper; small branches are moved.	·67	15	13-18
5	Smacks shorten sail ..	Small trees in leaf begin to sway; crested wavelets form on inland waters.	1·31	21	19-24
6	Smacks have double reef in main sail. Care required when fishing.	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.	2·3	27	25-31
7	Smacks remain in harbour, and those at sea lie to.	Whole trees in motion; inconvenience felt when walking against wind.	3·6	35	32-38
8	All smacks make for harbour, if near.	Breaks twigs off trees; generally impedes progress.	5·4	42	39-46
9	—	Slight structural damage occurs (chimney pots and slates removed).	7·7	50	47-54
10	—	Seldom experienced inland; trees uprooted; considerable structural damage occurs.	10·5	59	55-63
11	—	Very rarely experienced; accompanied by widespread damage.	14·0	68	64-75
12	—	—	Above 17·0	Above 75	Above 75

* The fishing smack in this column may be taken as representing a trawler of average type and trim. For larger or smaller boats and for special circumstances allowance must be made.

TABLES

The following table enables inches of mercury to be put into millibars and vice versa :—

TABLE I.—PRESSURE.
Equivalents in Millibars of Inches of Mercury at 32° F. Lat. 45°.

Hundredths of an inch.										
Inches. and Tenths.	0	1	2	3	4	5	6	7	8	9
	Millibars.									
27.0	914.3	914.6	915.0	915.3	915.7	916.0	916.3	916.7	917.0	917.4
27.1	917.7	918.0	918.4	918.7	919.0	919.4	919.7	920.1	920.4	920.7
27.2	921.1	921.4	921.8	922.1	922.4	922.8	923.1	923.4	923.8	924.1
27.3	924.5	924.8	925.1	925.5	925.8	926.2	926.5	926.8	927.2	927.5
27.4	927.9	928.2	928.5	928.9	929.2	929.5	929.9	930.2	930.6	930.9
27.5	931.2	931.6	931.9	932.3	932.6	932.9	933.3	933.6	933.9	934.3
27.6	934.6	935.0	935.3	935.6	936.0	936.3	936.7	937.0	937.3	937.7
27.7	938.0	938.3	938.7	939.0	939.4	939.7	940.0	940.4	940.7	941.1
27.8	941.4	941.7	942.1	942.4	942.8	943.1	943.4	943.8	944.1	944.4
27.9	944.8	945.1	945.5	945.8	946.1	946.5	946.8	947.2	947.5	947.8
28.0	948.2	948.5	948.8	949.2	949.5	949.9	950.2	950.5	950.9	951.2
28.1	951.6	951.9	952.2	952.6	952.9	953.2	953.6	953.9	954.3	954.6
28.2	954.9	955.3	955.6	956.0	956.3	956.6	957.0	957.3	957.7	958.0
28.3	958.3	958.7	959.0	959.3	959.7	960.0	960.4	960.7	961.0	961.4
28.4	961.7	962.1	962.4	962.7	963.1	963.4	963.7	964.1	964.4	964.8
28.5	965.1	965.4	965.8	966.1	966.5	966.8	967.1	967.5	967.8	968.1
28.6	968.5	968.8	969.2	969.5	969.8	970.2	970.5	970.9	971.2	971.5
28.7	971.9	972.2	972.6	972.9	973.2	973.6	973.9	974.2	974.6	974.9
28.8	975.3	975.6	975.9	976.3	976.6	977.0	977.3	977.6	978.0	978.3
28.9	978.6	979.0	979.3	979.7	980.0	980.3	980.7	981.0	981.4	981.7
29.0	982.0	982.4	982.7	983.0	983.4	983.7	984.1	984.4	984.7	985.1
29.1	985.4	985.8	986.1	986.4	986.8	987.1	987.5	987.8	988.1	988.5
29.2	988.8	989.1	989.5	989.8	990.2	990.5	990.8	991.2	991.5	991.9
29.3	992.2	992.5	992.9	993.2	993.5	993.9	994.2	994.6	994.9	995.2
29.4	995.6	995.9	996.3	996.6	996.9	997.3	997.6	997.9	998.3	998.6
29.5	999.0	999.3	999.6	1000.0	1000.3	1000.7	1001.0	1001.3	1001.7	1002.0
29.6	1002.4	1002.7	1003.0	1003.4	1003.7	1004.0	1004.4	1004.7	1005.1	1005.4
29.7	1005.7	1006.1	1006.4	1006.8	1007.1	1007.4	1007.8	1008.1	1008.4	1008.8
29.8	1009.1	1009.5	1009.8	1010.1	1010.5	1010.8	1011.2	1011.5	1011.8	1112.2
29.9	1012.5	1012.8	1013.2	1013.5	1013.9	1014.2	1014.5	1014.9	1015.2	1015.6
30.0	1015.9	1016.2	1016.6	1016.9	1017.3	1017.6	1017.9	1018.3	1018.6	1018.9
30.1	1019.3	1019.6	1020.0	1020.3	1020.6	1021.0	1021.3	1021.7	1022.0	1022.3
30.2	1022.7	1023.0	1023.3	1023.7	1024.0	1024.4	1024.7	1025.0	1025.4	1025.7
30.3	1026.1	1026.4	1026.7	1027.1	1027.4	1027.7	1028.1	1028.4	1028.8	1029.1
30.4	1029.4	1029.8	1030.1	1030.5	1030.8	1031.1	1031.5	1031.8	1032.2	1032.5
30.5	1032.8	1033.2	1033.5	1033.8	1034.2	1034.5	1034.9	1035.2	1035.5	1035.9
30.6	1036.2	1036.6	1036.9	1037.2	1037.6	1037.9	1038.2	1038.6	1038.9	1039.3
30.7	1039.6	1039.9	1040.3	1040.6	1041.0	1041.3	1041.6	1042.0	1042.3	1042.6
30.8	1043.0	1043.3	1043.7	1044.0	1044.3	1044.7	1045.0	1045.4	1045.7	1046.0
30.9	1046.4	1046.7	1047.1	1047.4	1047.7	1048.1	1048.4	1048.7	1049.1	1049.4
31.0	1049.8	1050.1	1050.4	1050.8	1051.1	1051.5	1051.8	1052.1	1052.5	1052.8
31.1	1053.1	1053.5	1053.8	1054.2	1054.5	1054.8	1055.2	1055.5	1055.9	1056.2
31.2	1056.5	1056.9	1057.2	1057.5	1057.9	1058.2	1058.6	1058.9	1059.2	1059.6
31.3	1059.9	1060.3	1060.6	1060.9	1061.3	1061.6	1062.0	1062.3	1062.6	1063.0
31.4	1063.3	1063.6	1064.0	1064.3	1064.7	1065.0	1065.3	1065.7	1066.0	1066.4

Thousandths of an Inch.

Inch	.001	.002	.003	.004	.005	.006	.007	.008	.009
Millibars.	.0	.1	.1	.1	.2	.2	.2	.3	.3

1000 millibars=1 bar=29.5306 mercury-inches=750.076 mercury millimetres (using
1 inch=2.54000 cm.)

TABLE II.—TABLE OF CORRECTIONS FOR REDUCING BAROMETRIC HEIGHTS TO 0° C. AND TO SEA LEVEL.

NOTE.—The barometric reading should first be corrected for index error. This error may be neglected if it is less than 0.3 mm. The + sign indicates that the correction is to be added to the barometric ruling. The - sign indicates that the correction is to be subtracted.

Temperature by the thermometer attached to the barometer		-4° C. 24.8° F.	-2° C. 28.4° F.	0° C. 32° F.	+2° C. 35.6° F.	4° C. 39.2° F.	6° C. 42.8° F.	8° C. 46.4° F.	10° C. 50° F.	12° C. 53.6° F.	14° C. 57.2° F.	16° C. 60.8° F.	18° C. 64.4° F.	20° C. 68° F.	22° C. 71.6° F.	24° C. 75.2° F.	26° C. 78.8° F.	28° C. 82.4° F.
Corrections to be made.																		
M'tres.	Ft. In.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.
0	0 0	+0.5	+0.3	0.0	-0.2	-0.5	-0.7	-1.0	-1.2	-1.5	-1.7	-2.0	-2.2	-2.5	-2.7	-3.0	-3.2	-3.5
1	3 3	+0.6	0.4	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.1	2.4	2.6	2.9	3.1	3.4
2	6 7	+0.8	0.5	0.3	0.0	0.3	0.5	0.7	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.8	3.0	3.2
3	9 10	+0.9	0.6	0.4	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.1	2.4	2.6	2.9	3.1
4	13 1	+1.0	0.8	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.8	3.0
5	16 5	+1.2	0.9	0.7	0.4	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.1	2.4	2.7	2.9
6	19 8	+1.3	1.0	0.8	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.6	2.8
7	22 0	+1.4	1.2	0.9	0.6	0.3	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.2	2.4	2.7
8	26 3	+1.5	1.3	1.0	0.7	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.1	2.3	2.6
9	29 6	+1.7	1.4	1.2	0.8	0.6	0.3	+0.1	0.2	0.4	0.6	0.9	1.1	1.4	1.6	2.0	2.2	2.5
10	32 10	+1.8	1.6	1.3	1.0	0.7	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.3	1.5	1.9	2.1	2.4
11	36 1	+1.9	1.7	1.4	1.1	0.8	0.6	0.3	+0.1	0.2	0.4	0.7	0.9	1.2	1.4	1.8	2.0	2.2
12	39 4	+2.0	1.8	1.5	1.2	1.0	0.7	0.5	0.2	0.0	0.3	0.5	0.8	1.1	1.3	1.6	1.9	2.1
13	42 8	+2.2	1.9	1.7	1.3	1.1	0.8	0.6	0.3	+0.1	0.2	0.4	0.7	0.9	1.2	1.5	1.8	2.0
14	45 11	+2.3	2.0	1.8	1.5	1.2	0.9	0.7	0.4	0.2	0.0	0.3	0.6	0.8	1.1	1.4	1.6	1.9
15	49 3	+2.4	2.2	2.0	1.6	1.4	1.1	0.8	0.6	0.3	+0.1	0.2	0.5	0.7	1.0	1.3	1.5	1.8
16	52 6	+2.5	2.3	2.0	1.7	1.5	1.2	0.9	0.7	0.4	0.2	0.1	0.4	0.6	0.9	1.2	1.4	1.6
17	55 9	+2.6	2.4	2.1	1.9	1.6	1.3	1.1	0.8	0.6	0.3	+0.1	0.3	0.5	0.8	1.0	1.3	1.5
18	59 1	+2.8	2.5	2.3	2.0	1.7	1.4	1.2	0.9	0.7	0.4	0.2	0.1	0.4	0.6	0.9	1.2	1.4
19	62 4	+2.9	2.6	2.4	2.1	1.9	1.5	1.3	1.0	0.8	0.6	0.3	0.0	0.3	0.5	0.8	1.0	1.3
20	65 7	+3.0	2.8	2.5	2.3	2.0	1.7	1.4	1.2	0.9	0.7	0.4	+0.1	0.2	0.4	0.7	0.9	1.2
21	68 11	+3.1	2.9	2.6	2.4	2.1	1.8	1.5	1.3	1.0	0.8	0.5	0.2	0.1	0.3	0.6	0.8	1.1
22	72 2	+3.3	3.0	2.8	2.5	2.2	1.9	1.7	1.4	1.2	0.9	0.6	0.3	+0.1	0.2	0.4	0.7	0.9
23	75 6	+3.4	3.1	2.9	2.6	2.4	2.1	1.8	1.5	1.3	1.0	0.8	0.4	0.2	0.1	0.3	0.6	0.8

Height of barometer cistern above sea level.

TABLE III.—CORRECTIONS FOR REDUCING THE BAROMETER READINGS FOR GRAVITY AT
LATITUDE 45°.For Latitudes 0° to 44° N. or S. the correction is to be *subtracted*.46° to 90° N. or S. „ „ *added*.

Latitude.		HEIGHT OF THE BAROMETER IN INCHES.								
		27·0	27·5	28·0	28·5	29·0	29·5	30·0	30·5	31·0
		In.	In.	In.	In.	In.	In.	In.	In.	In.
45	45	·000	·000	·000	·000	·000	·000	·000	·000	·000
44	46	·002	·002	·003	·003	·003	·003	·003	·003	·003
43	47	·005	·005	·005	·005	·005	·005	·005	·006	·006
42	48	·007	·007	·008	·008	·008	·008	·008	·008	·008
41	49	·010	·010	·010	·010	·010	·011	·011	·011	·011
40	50	·012	·012	·013	·013	·013	·013	·013	·014	·014
39	51	·015	·015	·015	·015	·016	·016	·016	·016	·017
38	52	·017	·017	·018	·018	·018	·018	·019	·019	·019
37	53	·019	·020	·020	·020	·021	·021	·021	·022	·022
36	54	·022	·022	·022	·023	·023	·024	·024	·024	·025
35	55	·024	·024	·025	·025	·026	·026	·027	·027	·027
34	56	·026	·027	·027	·028	·028	·029	·029	·030	·030
33	57	·028	·029	·029	·030	·031	·031	·032	·032	·033
32	58	·031	·031	·032	·032	·033	·033	·034	·035	·035
31	59	·033	·033	·034	·035	·035	·036	·036	·037	·038
30	60	·035	·036	·036	·037	·038	·038	·039	·039	·040
29	61	·037	·038	·038	·039	·040	·040	·041	·042	·043
28	62	·039	·040	·041	·041	·042	·043	·043	·044	·045
27	63	·041	·042	·043	·043	·044	·045	·046	·046	·047
26	64	·043	·044	·045	·045	·046	·047	·048	·049	·049
25	65	·045	·046	·047	·047	·048	·049	·050	·051	·052
24	66	·047	·048	·049	·049	·050	·051	·052	·053	·054
23	67	·049	·049	·050	·051	·052	·053	·054	·055	·056
22	68	·050	·051	·052	·053	·054	·055	·056	·057	·058
21	69	·052	·053	·054	·055	·056	·057	·058	·059	·060
20	70	·054	·055	·056	·057	·058	·059	·060	·061	·062
19	71	·055	·056	·057	·058	·059	·060	·061	·062	·063
18	72	·057	·058	·059	·060	·061	·062	·063	·064	·065
17	73	·058	·059	·060	·061	·062	·063	·064	·065	·067
16	74	·059	·060	·061	·063	·064	·065	·066	·067	·068
15	75	·061	·062	·063	·064	·065	·066	·067	·068	·070
14	76	·062	·063	·064	·065	·066	·067	·069	·070	·071
13	77	·063	·064	·065	·066	·068	·069	·070	·071	·072
12	78	·064	·065	·066	·067	·069	·070	·071	·072	·073
11	79	·065	·066	·067	·068	·070	·071	·072	·073	·074
10	80	·066	·067	·068	·069	·071	·072	·073	·074	·075
9	81	·067	·068	·069	·070	·071	·073	·074	·075	·076
8	82	·067	·068	·070	·071	·072	·073	·075	·076	·077
7	83	·068	·069	·070	·072	·073	·074	·075	·077	·078
6	84	·068	·070	·071	·072	·073	·075	·076	·077	·079
5	85	·069	·070	·071	·073	·074	·075	·077	·078	·079
4	86	·069	·071	·072	·073	·074	·076	·077	·078	·080
3	87	·070	·071	·072	·073	·075	·076	·077	·079	·080
2	88	·070	·071	·072	·074	·075	·076	·078	·079	·080
1	89	·070	·071	·072	·074	·075	·076	·078	·079	·080
0	90	·070	·071	·073	·074	·075	·076	·078	·079	·080

TABLE IV.

Relation between inches and millimetres for comparison of readings of barometers graduated in these units.

In.	Mm.	In.	Mm.	In.	Mm.	In.	Mm.
27.0	685.8	28.0	711.2	29.0	736.6	30.0	762.0
27.2	690.9	28.2	716.3	29.2	741.7	30.2	767.1
27.4	696.0	28.4	721.4	29.4	746.8	30.4	772.2
27.6	701.0	28.6	726.4	29.6	751.8	30.6	777.2
27.8	706.1	28.8	731.5	29.8	756.9	30.8	782.3

NOTE.—(1) The table is based on the legal relation 1 in. = 2.5400 cm., which agrees very closely indeed with the best experimental comparisons.

(2) As millimetre barometers have the same standard temperature 0° C. for the brass scale and for the mercury, while inch barometers have a standard 32° F. for the mercury and 60° F. for the brass scale, the readings require correction for temperature by appropriate tables before the comparison can be made.

TABLE V.

TABLE FOR CONVERSION OF DEGREES FAHRENHEIT INTO DEGREES CENTIGRADE AND DEGREES ABSOLUTE.

°F.	°C.	a.	°F.	°C.	a.	°F.	°C.	a.	°F.	°C.	a.
20	-6.7	266.3	45	7.2	280.2	70	21.1	294.1	95	35.0	308.0
21	-6.1	266.9	46	7.8	280.8	71	21.7	294.7	96	35.6	308.6
22	-5.6	267.4	47	8.3	281.3	72	22.2	295.2	97	36.1	309.1
23	-5.0	268.0	48	8.9	281.9	73	22.8	295.8	98	36.7	309.7
24	-4.4	268.6	49	9.4	282.4	74	23.3	296.3	99	37.2	310.2
25	-3.9	269.1	50	10.0	283.0	75	23.9	296.9	100	37.8	310.8
26	-3.3	269.7	51	10.6	283.6	76	24.4	297.4	101	38.3	311.3
27	-2.8	270.2	52	11.1	284.1	77	25.0	298.0	102	38.9	311.9
28	-2.2	270.8	53	11.7	284.7	78	25.6	298.6	103	39.4	312.4
29	-1.7	271.3	54	12.2	285.2	79	26.1	299.1	104	40.0	313.0
30	-1.1	271.9	55	12.8	285.8	80	26.7	299.7	105	40.6	313.6
31	-0.6	272.4	56	13.3	286.3	81	27.2	300.2	106	41.1	314.1
32	0.0	273.0	57	13.9	286.9	82	27.8	300.8	107	41.7	314.7
33	+0.6	273.6	58	14.4	287.4	83	28.3	301.3	108	42.2	315.2
34	1.1	274.1	59	15.0	288.0	84	28.9	301.9	109	42.8	315.8
35	1.7	274.7	60	15.6	288.6	85	29.4	302.4	110	43.3	316.3
36	2.2	275.2	61	16.1	289.1	86	30.0	303.0	111	43.9	316.9
37	2.8	275.8	62	16.7	289.7	87	30.6	303.6	112	44.4	317.4
38	3.3	276.3	63	17.2	290.2	88	31.1	304.1	113	45.0	318.0
39	3.9	276.9	64	17.8	290.8	89	31.7	304.7	114	45.6	318.6
40	4.4	277.4	65	18.3	291.3	90	32.2	305.2	115	46.1	319.1
41	5.0	278.0	66	18.9	291.9	91	32.8	305.8	116	46.7	319.7
42	5.6	278.6	67	19.4	292.4	92	33.3	306.3	117	47.2	320.2
43	6.1	279.1	68	20.0	293.0	93	33.9	306.9	118	47.8	320.8
44	6.7	279.7	69	20.6	293.6	94	34.4	307.4	119	48.3	321.3

TABLE VI.

WIND VELOCITY:

Conversion Table from Miles per Hour to Metres per Second.

1 mile per hour = 0.44704 metre per second.

Miles per Hour	0	1	2	3	4	5	6	7	8	9
	Metres per Second.									
0	0.0	0.4	0.9	1.3	1.8	2.2	2.7	3.1	3.6	4.0
10	4.5	4.9	5.4	5.8	6.3	6.7	7.2	7.6	8.0	8.5
20	8.9	9.4	9.8	10.3	10.7	11.2	11.6	12.1	12.5	13.0
30	13.4	13.9	14.3	14.8	15.2	15.6	16.1	16.5	17.0	17.4
40	17.9	18.3	18.8	19.2	19.7	20.1	20.6	21.0	21.5	21.9
50	22.4	22.8	23.2	23.7	24.1	24.6	25.0	25.5	25.9	26.4
60	26.8	27.3	27.7	28.2	28.6	29.1	29.5	30.0	30.4	30.8
70	31.3	31.7	32.2	32.6	33.1	33.5	34.0	34.4	34.9	35.3
80	35.8	36.2	36.7	37.1	37.6	38.0	38.4	38.9	39.3	39.8
90	40.2	40.7	41.1	41.6	42.0	42.5	42.9	43.4	43.8	44.3
100	44.7	45.2	45.6	46.0	46.5	46.9	47.4	47.8	48.3	48.7

TABLE VII.

RAINFALL TABLE FOR CONVERSION OF INCHES TO MILLIMETRES.

Ins.	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
	Millimetres.									
0.0	0.00	0.25	0.51	0.76	1.02	1.27	1.52	1.78	2.03	2.29
0.1	2.54	2.79	3.05	3.30	3.56	3.81	4.06	4.32	4.57	4.83
0.2	5.08	5.33	5.59	5.84	6.10	6.35	6.60	6.86	7.11	7.37
0.3	7.62	7.87	8.13	8.38	8.64	8.89	9.14	9.40	9.65	9.91
0.4	10.16	10.41	10.67	10.92	11.18	11.43	11.68	11.94	12.19	12.45
0.5	12.70	12.95	13.21	13.46	13.72	13.97	14.22	14.48	14.73	14.99
0.6	15.24	15.49	15.75	16.00	16.26	16.51	16.76	17.02	17.27	17.53
0.7	17.78	18.03	18.29	18.54	18.80	19.05	19.30	19.56	19.81	20.07
0.8	20.32	20.57	20.83	21.08	21.34	21.59	21.84	22.10	22.35	22.61
0.9	22.86	23.11	23.37	23.62	23.88	24.13	24.38	24.64	24.89	25.15
1.0	25.40	25.65	25.91	26.16	26.42	26.67	26.92	27.18	27.43	27.69
1.1	27.94	28.19	28.45	28.70	28.96	29.21	29.46	29.72	29.97	30.23
1.2	30.48	30.73	30.99	31.24	31.50	31.75	32.00	32.26	32.51	32.77
1.3	33.02	33.27	33.53	33.78	34.04	34.29	34.54	34.80	35.05	35.31
1.4	35.56	35.81	36.07	36.32	36.58	36.83	37.08	37.34	37.59	37.85
1.5	38.10	38.35	38.61	38.86	39.12	39.37	39.62	39.88	40.13	40.39
1.6	40.64	40.89	41.15	41.40	41.66	41.91	42.16	42.42	42.67	42.93
1.7	43.18	43.43	43.69	43.94	44.20	44.45	44.70	44.96	45.21	45.47
1.8	45.72	45.97	46.23	46.48	46.74	46.99	47.24	47.50	47.75	48.01
1.9	48.26	48.51	48.77	49.02	49.28	49.53	49.78	50.04	50.29	50.55
2.0	50.80	51.05	51.31	51.56	51.82	52.07	52.32	52.58	52.83	53.09

WEATHER REPORTS

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
ALASKA Dutch Harbour, NPR, 2,255 sp.	0530 1730 request	— —	S. S.	— —	Current barometrie pressure, wind force and direction and state of weather
ALGERIA Oran (Ain-el-Turck), FUK, 3,500 c.w.	0140 0905 1345 1845	0100 0700 1300 1800	S. S. S. S.	French Met: Code " " " "	SYNOPTIC REPORTS (1) "Météo Oran" (31, 32, 61) InIn BBBTT cbbP DDFNV (1) "Météo Oran" (01-46) InIn BBBTT cb,b,jj DDFNV ddF nh w,w, PA ₁ A ₂ Rrd ₃ (2) "Pilot" InInGG ddf ddf ddf, etc. (1) "Météo Oran" (31-69) InIn BBBTT cb,b,jj DDFNV ddF nh w,w, PA ₁ A ₂ (1) "Météo Oran" (31-69) InIn BBBTT cb,b,jj DDFNV ddF nh w,w, PA ₁ A ₂ RRt ₂ t ₂ d ₃ Synoptic for Algeria Synoptic for Algeria NOTES: (1) See under French Meteorolo- gical Code and Eiffel Tower Synoptic (pages 611 & 656) for details of code (2) Stations 07 and 15 send index number and first three groups only of "surface" ob.
Algiers, FOA, 1,850 c.w. .. 2,100 c.w. ..	1345 1845	— —	S. S.	— —	
STATIONS:					
01 TANGIER	10 FEZ	18 Timadit	38 Colomb-Béchar	46 Adrar	68 Metlaoui
03 RABAT	11 Taza	31 ORAN	39 Béni-Abbès	61 TUNIS	69 Qabes
04 Casablanca	12 Ujda	32 ALGIERS	40 Timimoun	62 BIZERTA	80 Funchal
05 Safi	13 Marrakesh	33 SETIF	41 Laghwat	63 Sfax	81 Angra
06 Mogador	14 Midelt	34 BISKRA	42 Ain-Sefra	64 Medinine	82 Port Etienne
07 AGADIR	15 BU DENIB	35 Touggourt	43 El-Goléa	65 Tozeur	83 Dakar
08 Ouezzan	16 Kasbah Tadla	36 Ouargla	44 El-Oued	66 Ben Gardane	
09 Meknes	17 Guercif	37 In-Salah	45 Ghardaïa	67 Susa	
(1)	(2)	(3)	(4)	(5)	(6)
ARABIA Aden, BZF, 2,000 sp. for 0945 and 1745 messages, 600 sp. for 0145 message	0945 1745 0145	— — —	S.W. S.W. S.W.	p.l. p.l. p.l.	Plain language message relating to Eastern portion of Arabian Sea only, prefixed by words "East Arabian Sea." The warnings deal exclusively with storms, stormy winds, and the absence of storms. Frequently the phrase "Weather normal" is used in these messages. For the information of mariners and others interested, the meaning of this phrase is:— "As far as coast observations and available ships' reports indicate there is no reason for thinking that a storm has formed or is forming." (This report is prepared in the Meteorological office at Simla, India.) The 0145 report is only transmitted when disturbed or stormy weather is anticipated.
ARGENTINE Buenos Aires (Darsena Norte), 0205 LIH, 1,000 sp.	—	—	S.F.	p.l.	<i>En clair</i> (Spanish) message followed by forecast for the ensuing 24 hours for the Rio de la Plata
AUSTRALIAN COMMON- WEALTH Western Australia Perth, VIP, 600 sp. ..	0300 1300	— —	S.F. S.F.	p.l. p.l.	Ocean forecasts for the ensuing 24 hours are sent daily except Saturdays but including Sundays. On Saturdays, the 0300 forecast only is issued and is for the ensuing 48 hours. Ocean forecasts for the ensuing 24 hours are sent twice daily from Mondays to Fridays inclu- sive. On Saturdays, the 0300 forecast only is issued and is for the ensuing 48 hours. No reports issued on Sundays, but see under Perth above.
Wyndham, VIW, 600 sp. ..	0300 13.0	— —	S.F. S.F.	p.l. p.l.	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
AUSTRALIAN COMMON-WEALTH—contd.					
Broome, VIO, 600 sp. ..	0300 1300	— —	S.F. S.F.	p.l. p.l.	} As above.
Geraldton, VIN, 600 sp. ..	0300 1300	— —	S.F. S.F.	p.l. p.l.	
Esperance, VIE, 600 sp.	0300 1300	— —	S.F. S.F.	p.l. p.l.	} As above.

GENERAL NOTES.—In addition to the general forecasts, the readings of the barometer, and particulars of observations of wind direction and force, state of weather, and state of sea at Fremantle, Cape Loouwin, and Breaksea Island are regularly broadcast from the radio stations at Geraldton, Applecross and Esperance. 0100 and 0700 readings are supplied on weekdays; 0100 readings on Saturdays, and 0100 and 0000 readings on Sundays.

Koepang 0100 barometer wind and weather reports when available in time are included in the report supplied to the Geraldton and Applecross radio stations and are also transmitted to the radio stations at Wyndham and Broom and broadcast with the regular Ocean Forecast.

When very disturbed weather is expected, weather reports from additional coastal stations, such as Geraldton and Carnarvon and sometimes Onslow, are included in the messages sent to radio stations serving the area likely to be affected, and broadcast with the Ocean Forecast.

SPECIAL OCEAN FORECASTS AND REPORTS FOR N.W. COAST.—Special warnings of the approach of cyclonic storms of tropical origin are sent to all ports from Geraldton northwards, and to all Western Australian radio stations except Esperance for immediate broadcasting. Particulars of barometer readings and other observations at representative North-western stations are broadcast with these special forecasts.

SPECIAL NOTE.—When dangerous weather prevails, or is expected, special reports and warnings are immediately issued to be forthwith broadcast from the radio stations serving the area affected.

(1)	(2)	(3)	(4)	(5)	(6)
South Australia					
Adelaide, VIA, 600 sp. ..	1130 1330	0530 0530	S.F. S.F.	p.l. p.l.	} Ocean forecasts for the ensuing 24 hours are sent daily, including Saturday and Sunday preceded by a statement of weather conditions at 0530. The forecast broadcast on Saturday refers to the 48 hours following 0230 (local noon) on Saturday and is not usually accompanied by a 0530 weather report. A summary of 2330 weather reports and 24 hours' forecast are available on application to Adelaide radio station after 0200 daily except on Sundays. Special warnings are broadcast immediately they are received. A report of coastal weather and a 6-hour forecast. These reports are transmitted to ships at any other time when asked for. Coastal weather and a 24-hour forecast sent daily except Sundays. The forecast issued on Saturday afternoon is for 48 hours.
Queensland					
Brisbane, VIB, 600 sp. ..	Between 0200- 0230 request 1200 approx.	2300 0500	S.F. S.F.	p.l. p.l.	

All special storm-warnings are broadcast from Brisbane radio station immediately on receipt and thereafter in the regular watches kept by coastal vessels until receipt of the next advice from the Brisbane Weather Bureau. If a vessel asks for a special warning between watches, it is transmitted immediately if available.

(1)	(2)	(3)	(4)	(5)	(6)
Willis Island, Queensland					
Willis Islets, CGI, 600 sp. ..	2330 0645 1045	2300 0500 0800	S. S. S.	p.l. p.l. p.l.	} During the period commencing about the middle of November, and ending about 30th April, the meteorological radio-telegraph station on Willis Island broadcasts particulars of height of barometer, wind direction and force, amount of cloud, state of weather, state of sea and characteristic and direction of ocean swell if any. During stormy conditions, however, 1000 observations are substituted for the 0800 observations usually broadcast at 1045.
New South Wales					
Sydney, VIS, 600 sp. ..	—	—	—	—	

Every day except on Sundays the radio station at Carlingford (Sydney) broadcasts a 2300 weather report and a 24 hours' forecast during the 2300 to 0030 watch if the Weather Bureau is in receipt of data sufficient for the preparation of a forecast during the time; if report and forecast are not available until after 0030, they are broadcast during the 0200 to 0300 watch.

An afternoon weather report and a 24 hours' forecast are available on application after 0630 daily except on Saturdays, and are broadcast at 1030 on the day of receipt, and repeated at 2230 on the day following.

Special storm warnings are broadcast immediately on receipt, and are repeated at intervals until the issue of the next advice from the Weather Bureau.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
AUSTRALIAN COMMON-WEALTH—contd.					
Victoria					
Melbourne, VIM, 600 sp. ..	*0200	2300	S.F.	p.l.	A summary of 2300 weather reports and a 24 hour forecast sent daily except Sundays.
	1100 approx.	0500	S.F.	p.l.	A later forecast for 24 hours; sent daily, including Saturdays and Sundays. Except on Saturday nights, this forecast is usually preceded by a 0500 weather report <i>en clair</i> .
Tasmania					Special warnings are sent immediately upon receipt.
Hobart, VIH, 600 sp. ..	request	2300	S.F.	p.l.	A summary of the 2300 reports and a 24-hour forecast are transmitted on application by shipping after about 0330 daily, except on Sunday. Saturday's forecasts are for the ensuing 48 hours.
					Special warnings are broadcast immediately upon receipt and at hourly intervals thereafter until 1000 G.M.T.
AUSTRIA					SYNOPTIC REPORTS.
Deutsch-Altenburg (near Wien)	0820	2000	S.	O.I.C.	"Météo Wien" InIn BBBDD FwTTW ₁
OHO, 3,050 c.w.		0600	—	(mod.)	BBBDD FwTTU cbbRR MmmV (first two groups refer to 2000 G.M.T. of previous day)
					Stations: 01 Wien
					02 Klagenfurt
					03 Sonnblick (3,106 m.)
					04 Villach
					05 Graz
					06 Obir (2,041 m.)
					NOTE: W ¹ and V in N.I.C.
AZORES					SYNOPTIC REPORTS.
Ferreira, PQT, 1,000 ..	1330	1300	S.	N.I.C.	(Station name <i>en clair</i>) BBDDx ₁ FwwHx ₂
	1830	1800	S.	"	cbWVx ₃ CNTTx ₄ KdGGx ₅ y ₁ y ₂ y ₃ y ₄ z
					(Station name <i>en clair</i>) BBDDx ₁ FwwHx ₂
					cbWVx ₃ CNMMx ₄ RRSrx ₅ KdGGx ₆ y ₁ y ₂ y ₃ y ₄ z
					STATIONS: Angra, Horta, Ponta Delgada.
BELGIUM					
Brussels, OPO, 1,100 R/T ..	1100	0700	F.	p.l.	General meteorological situation and forecast available until following day <i>en clair</i>
	1550	1300	F.	p.l.	Repetition of former message with corrections following the ob. of 1300 <i>en clair</i>
Ostende, OPVO, 1,680 c.w.	0819 to 1619	—	—	—	Hourly messages containing the Ostende ob. of the preceding even hour
West Hinder Light Vessel, OTW, 600 sp.	—	—	—	—	Met. ob. are transmitted to Ostende Aerodrome
BERMUDA					
Bermuda Dockyard, BZB, 1,600 sp. for 0015 and 1215 messages, 600 sp. for other messages	0015 0020 1215 1220	—	—	p.l.	Weather conditions prevailing at Bermuda
BRAZIL					
Rio de Janeiro, SOH, 600 sp.	0000 1200 1500 1800 2100	—	S. " " " "	p.l. " " " "	{ <i>En clair</i> messages (Portuguese) giving the state of the weather, state of the sea, and the direction and force of wind.
	1800	—	S.	N.I.C.	
Rio de Janeiro, SOH, 1,800 sp.	1800	1200	S.	N.I.C.	SYNOPTIC REPORTS. (1) InIn BBBDD FwTT (The last group is not given for stations 25-38 inclusive) (2) "Pilot" InIn h ₁ ddvv h ₁ ddvv, etc. (3) Previsão (This is a night weather forecast <i>en clair</i> —Portuguese) (1) (Stations 08, 09, 11, 17, 22, 24 only) as for 1800 (1) report above (2) "Temp Alegrete" BBTTH BBTTH, etc. (Pressure temp. and humidity of the upper air as ob. at Alegrete, Rio Grande do Sul) (3) "Previsão" detailed forecasts <i>en clair</i> (Portuguese) for the following day for the south coast of the State of Rio de Janeiro, as well as general forecasts (also for the next day) for the remainder of the Brazilian coast and Buenos Aires)
	—	—	U.A. F.	N.I.C. p.l.	
	0100	2100	S.	N.I.C.	
			U.A.T.	"	
			F.	p.l.	

BRAZIL—contd.**STATIONS:**

01 Ondina	09 Cabo Frio	17 Florianopolis	25 Sta. Isabel	33 Victorica
02 Caetité	10 São Paulo	18 Palmas	26 Montevideo	34 Cipolletti
03 Victoria	11 Santos	19 Porto Alegre	27 Buenos Aires	35 Bahia Blanca
04 Bello Horizonte	12 S. Paulo dos Agudos	20 Uruguayana	28 Oran	36 Puerto Madryn
05 Uberaba	13 Cuyabá	21 S. Luiz das Missões	29 Adalgala	37 Sarmiento
06 Pirapora	14 Coxim	22 Rio Grande	30 Corrientes	38 I de Outubro
07 Juiz de Fôra	15 Tres Lagoas	23 Bagé	31 Santa Fé	
08 Rio de Janeiro	16 Curitiba	24 S. Victoria do Palmar	32 Mendoza	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) Belém (Pará), SPB	(2) 0245 0645 etc.	(3) — — —	(4) — — —	(5) p.l. — —	(6) <i>En clair</i> message (Portuguese) sent every four hours
São Luiz (Maranhão), SOM	0300 0700 etc.	— — —	— — —	p.l.	do. do. do.
Port Natal, SNR	0330 0730 etc.	— — —	— — —	p.l.	do. do. do.
Olinda (Pernambuco), SPO	0345 0745 etc.	— — —	— — —	p.l.	do. do. do.
Amaralina (Bahia), SPA ..	0315 0715 etc.	— — —	— — —	p.l.	do. do. do.
Fernando Noronha, SPN ..	0315 0715 etc.	— — —	— — —	p.l.	do. do. do.
Abrolhos, SNN	0320 0720 etc.	— — —	— — —	p.l.	do. do. do.
Cabo de São Thorne, SPT ..	0330 0730 etc.	— — —	— — —	p.l.	do. do. do.
Mont Serrat (Santos), SPS ..	0245 0645 etc.	— — —	— — —	p.l.	do. do. do.
Santa Cruz (Florianopolis), SOV	0315 0715 etc.	— — —	— — —	p.l.	do. do. do.
Juncção (Rio Grande do Sul), SPJ (all above 600 sp.)	0345 0745	— —	— —	p.l.	do. do. do.
BRITISH HONDURAS					
Belize, VPP, 1,500 c.w. ..	1200 2330	— —	— —	—	Daily weather reports
BRITISH INDIA					
Karachi, VWK, 2,000 (daily)	{ 0830 1630	—	—	p.l.	1. Weather bulletins are signalled broadcast each day from coast radio-stations; the issues, which are ordinarily twice daily, are increased in disturbed or stormy weather to three or six times a day, the "Extra" and "Storm" messages being preceded by the TTT safety signal; occasionally, when the situation demands it, messages are broadcast under the TTT signal at intervening times also. 2. The report sent out from Karachi and Bombay normally gives the weather conditions in the East Arabian Sea, while that broadcast from the other four stations refers to the Bay of Bengal.
600 (extra) ..	0030				
600 (storm) ..	{ 0430 1230 2030				
Bombay, VWB, 2,000 (daily)	{ 0900 1700	—	—	p.l.	
600 (extra)	0100				
600 (storm)	{ 0500 1300 2100				
Madras, VWM, 1,000 (daily)	{ 0900 1700	—	—	p.l.	
600 (extra)	0100				
600 (storm)	{ 0500 1300 2100				

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
BRITISH INDIA—contd.					
Calcutta, VWC, 2,000 (daily)	{ 0830 1630 0030	—	—	p.l.	
600 (extra)	{ 0430 1230				
600 (storm)	{ 2030 0900				
Rangoon, VTR, 1,200 (daily)	{ 1700 0100	—	—	p.l.	
600 (extra)	{ 0500 1300				
600 (storm)	2100				
BRITISH NORTH BORNEO					
Tawao, VQC. Jesselton, VQA. Sandakan, VQB. Kudat, VQD. (All 600 sp.)	—	—	—	—	Typhoon warnings are transmitted im- mediately upon receipt
BULGARIA					SYNOPTIC REPORTS.
Sofia, FF, 3,500 sp. ..	0655	0527	S.	German	Kenngruppe 0530 BBBDD Fw ₁ TTd ₂
	1355	0027	S.	mct. "	c ₁ bbR ₂ R ₂ M ₂ M ₂ m ₂ m ₂ Kenngruppe 1230 BBBDD Fw ₁ TT c ₁ bb STATION: Sofia
CANADA (including Newfoundland)					
Pacific Coast					
Digby Is., B.C., VAJ ..	request	—	F.	p.l.	Weather forecasts issued by the Canadian Meteorological Service, transmitted to any ship on request
Dead Tree Point, B.C., VAH	"	—	"	"	do. do. do.
Buli Harbour, B.C., VAG	"	—	"	"	do. do. do.
Alert Bay, B.C., VAF	"	—	"	"	do. do. do.
Cape Lazo, B.C., VAC	"	—	"	"	do. do. do.
Estevan, B.C., VAE	"	—	"	"	do. do. do.
Point Grey, B.C., VAB	"	—	"	"	do. do. do.
Pachena, B.C., VAD	"	—	"	"	do. do. do.
Gonzales Hill (Victoria), B.C., VAK	"	—	"	"	do. do. do.
(All 600 m. spk., except Pachena, 800 m.)					
Atlantic Coast, The Gulf and River St. Lawrence up to Montreal					
Cape Sable, N.S., VCU	0200 1400	—	"	"	do. do. do.
Camperdown, N.S., VCS	request	—	"	"	do. do. do.
North Sydney, N.S., VCO	"	—	"	"	do. do. do.
Sable Island, N.S., VCT	"	—	"	"	do. do. do.
Lürcher Lt. Vessel VDR	"	—	"	"	
St John, N.B., VAR	"	—	"	"	This station keeps watch for the first half of every odd hour from 1100 to 2300, and from 0200 to 0230 G.M.T. Weather forecasts issued by the Canadian Meteorological Service transmitted to any ship on request.
Grindstone Id., P.Q., VCN	"	—	"	"	do. do. do.
Grosse Id., P.Q., VCD	"	—	"	"	do. do. do.
Quebec, P.Q., VCC	"	—	"	"	do. do. do.
Clarke City, P.Q., VCK	"	—	"	"	Keeps continuous watch during season of navigation only
Father Point, P.Q., VCF	"	—	"	"	do. do. do.
Montreal, P.Q., VCA	"	—	"	"	do. do. do.
Fame Point, P.Q., VCG	0145 } 1345 }	—	"	"	do. do. do.
Heath Point Lt. Vessel VCI	request	—	"	"	do. do. do.
Cape Race, Nfld., VCE	request	—	"	"	Weather forecasts issued by the Canadian Meteorological Service transmitted to any ship on request
Belle Isle, Nfld., VCM	"	—	"	"	do. do. do.
Point Amour, Nfld., VCL	"	—	"	"	do. do. do.
(All 600 m. spk.)					

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
CANADA—contd.					
Great Lakes					
Kingston, Ont. VBH	0400	—	F.	p.l.	Forecasts compiled by the Canadian Meteorological Service, Toronto, Ont.
Toronto, Ont. VBG	0340	—	"	"	do. do. do.
Port Burwell, Ont. VBF	0400	—	"	"	do. do. do.
Point Edward, Ont. VBE	0410	—	"	"	do. do. do.
Midland, Ont. VBC	0400	—	"	"	do. do. do.
Sault Ste Marie, Ont. VBB	0420	—	"	"	do. do. do.
Port Arthur, Ont. VBA	0430	—	"	"	do. do. do.
Tobermory, Ont. VBD	request	—	"	"	do. do. do.
(All 1,600 m. spk.)					<p>NOTES: (1) Reports also transmitted on request.</p> <p>(2) These stations are only open during the season of navigation and keep continuous watch on 600 metres:</p>
CAPE VERDE ISLANDS					
São Vicente, CRF, 1,000 sp.	1400	—	F.	p.l.	Forecast for whole of the Cape Verde Islands.
CEYLON					
Colombo, VPB, 600 sp. for 0500 and 1700 messages, 2,300 c.w. for 0600 and 1800 messages	0500* 0600* 1700* 1800*	— — — —	W.R. " " "	p.l. " " "	These reports are sent out immediately after the time signals. They refer to weather conditions in neighbourhood of Ceylon
CHILE					
Valparaiso, CCE, 1,000 sp. ..	0100*	2043	S.	N.I.C. N.I.C. (mod.)	SYNOPTIC REPORTS "OMC" (Meteorological Office of Chile) In BBDF
			S.	p.l.	Followed by a summary of weather changes which have taken place during the day.
			F.	p.l.	Forecast and statement of the probable approach of bad weather
			W.	p.l.	Storm warnings when necessary
	1700	1243	S.	N.I.C. (mod.)	"OMC" In BBDF
			F.	p.l.	As for 0100 message above
			W.	p.l.	Storm warnings when necessary
STATIONS:					<p>NOTES: (1) D = direction of surface wind on scale 0-8 (0 = calm, 1 = N., 5 = S., 8 = NW ch)</p> <p>(2) If the whole of the data from a station is missing the word "No" is sent before the station letter</p> <p>(3) If part of the observations is missing this is replaced by "x"</p> <p>(4) When necessary the following word will be added: Temporal (gale); Nebula (fog); Duvia (rain); Sol (sunny)</p>
V Valparaiso.					
T Talchuano.					
C Corral.					
J Juan Fernandez.					
M Mocha.					
G Guafó.					
R Ráper.					
P Punta Arenas.					
O Puerto Montt.					
Q Coquimbo.					
(1)	(2)	(3)	(4)	(5)	(6)
Talcahuano, CCK, 1,900 sp...	0130 1730	— —	— —	— —	Repeat of messages from Valparaiso (above)
CHINA					
Shanghai, FFZ, 750 sp. ..	0300*	0100	S.	p.l.	SYNOPTIC REPORTS.
	—	—	W. U.W.	p.l.	<p>(1) Report <i>en clair</i> sent in French and repeated in English</p> <p>(2) Typhoon and gale warnings <i>en clair</i></p> <p>(3) "Air currents." Altitudes are grouped and are indicated by the words "high" (15,000 to 6,000 metres), "mean" (5,500 to 2,500 metres) and "low" (2,000 to 500 metres). For each of these groups the direction of the wind is given <i>en clair</i>, i.e.—N., N.E., etc. several directions may figure for the same group and they refer to the wind at decreasing altitudes</p> <p>NOTES: The observations are taken immediately before transmission.</p> <p>The word "nil" is used when the observations for an altitude are missing.</p>

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
CHINA—contd.					
Shanghai, FFZ, 750 s.p.	0900 1400 1800	0700 1200 1200	S.W. S.W. S.W.	p.l. p.l. p.l.	As for 0300 message (1)-(2) above. Do. do. do. Do. do. do.
					SYNOPTIC REPORTS,
Tsingtao, XRT, -600 sp.	0000 1000	2200 0700	S. S.	N.I.C. (mod.) "	BBBDD FwwVA dTTt We'bbS as for 0000 message above
NOTES: (1) AS ₁ and V are New International Code. (2) tt=difference between dry and wet bulb thermometers. (3) W=Past weather.					
Code.	Code.	Code.	Code.	Code.	Code.
0. Fine.	2. Very cloudy.	4. Rain.	6. Fog, mist.	8. Hail.	
1. Cloudy.	3. Overcast.	5. Snow.	7. Thick fog.	9. Stormy.	
ww=Present weather.					
Code.	Code.	Code.	Code.	Code.	Code.
00. Fine.	08. Overcast.	14. Lightning.	20. Dust haze.	26. Stormy.	
02. Sky $\frac{1}{4}$ covered with clouds.	10. Rain.	16. Fog, mist.	22. Snow.	28. Gale.	
04. " $\frac{2}{4}$ " "	12. Squally.	18. Thick fog.	24. Hail.	30. Thunder.	
06. " $\frac{3}{4}$ " "					
(1)	(2)	(3)	(4)	(5)	(6)
Tsingtao	1300	—	W.	p.l.	<i>En clair</i> message in English, preceded by the QST signal repeated three times, and containing the following information:—Warning, date, time position of centre of cyclone (or typhoon), bar pressure at storm centre, direction in which centre is travelling. The message is repeated twice. Warnings are also sent out immediately upon receipt from Met. Station <i>En clair</i> (English) forecasts issued by the Taihoku Met. Ob. The messages are transmitted twice successively, and are preceded by the signal QST QST QST. They will contain the direction and force of the wind (Beaufort), and general weather conditions for the following day for the North and East coasts of Formosa, and for Formosa Channel, respectively. Wind direction will be indicated for eight points of the compass; "light winds" being given as "variable" EXAMPLE.—N.E. monsoon, moderate; cloudy, some rain. Northern and eastern coast areas. N.E. monsoon, strong; cloudy Formosa. Channel
Keelung (Formosa), JFK, 600 sp.	0800	—	F.	p.l.	
CUBA					
Guantanamo, NAW, 4,543 c.w.	0200	—	S.	p.l.	Weather reports are transmitted only during the hurricane season (July 1st to November 15th)
	—	—	W.	"	Hurricane warnings are transmitted when issued by the Washington Weather Bureau and repeated every 4 hours.
CZECHO-SLOVAKIA					
Prague, OKP, 6,120 c.w.	0750	0700	S.	N.I.C.	SYNOPTIC REPORTS. "Météo Tchécoslovaque" (01) InIn BBBDD FwwTT cbWVH ALaNh RRmmr C ₁ ddVV (05-32) InIn BBBDD FwwTT cbWVH ALaNh RRmmr "Sondages" InIn h ₁ ddvv h ₁ ddvv, etc. (01) BBBDD FwwTT cbWVH ALaNh C ₁ ddVV (05-32) InIn BBBDD FwwTT cbWVH ALaNh "Sondages InIn h ₁ ddvv h ₁ ddvv, etc. (01) InIn BBBDD FwwTT cbWVH ALaNh RRMMr C ₁ ddVV (05-32) InIn BBBDD FwwTT cbWVH ALaNh RRMMr Stations: 01 Prague 25 Kosice 05 Cheb 32 Olomouc 22 Vajnory-Bratislava
	1350	1300	U.W. S.	"	
	1850	1800	U.W. S.	"	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
CZECHO-SLOVAKIA—con.dt					
Prague, OKP, 1,400 c.w., 2,500 c.w.	Ob. and trans. will be issued by aerial time table		S. U.W.	N.I.C. mod.	AVIATION SYNOPTIC (special aerial routes "Aérométéo Tchecoslovaque") InIn PAVhL NDDFP (EQ)

Special Code:

P = Actual weather

A = Form of cloud lowest

L = Amount of cloud lowest

N = Total amount of sky covered with cloud

P₁ = Past weather in the last hour

E = State of sky (in the mountains)

Q = Change of sky (in the mountains)

V₁h₁DD₁F in N.I.C.

Synoptic stations:

00 Prague-Air Port

01 Prague-Met. Off.

04 Nem. Brod

05 Cheb

09 Frutnov

10 Jicin

13 Znojmo

15 Plzen

16 Tachov

19 Pelhrimov

20 Jihlava

22 Vajnory-Bratislava

25 Kosice

34 Nitra

39 Náchod

41 Karlovy Vary

43 Cerchov

44 Zvicina

45 Brno-Komárov

47 Vel. Meziníci

48 Lucenec

50 Roznava

DANZIG FREE STATE

Danzig, KAZ 600 sp.

0700

—

S.

German
Met.**SYNOPTIC REPORTS.**BBBDD Fw₁w₁TT c₁b₃W₃VP AN₁aNhR₁R₁m₂m₂Z₃BBBDD Fw₁w₁TT c₁b₃W₃VS₁BBBDD Fw₁w₁TT c₁b₃W₃VP AN₁aNhBBBDD Fw₁w₁TT c₁b₃W₃VS₁BBBDD Fw₁w₁TT c₁b₃W₃VP AN₁aNhR₁R₁m₂m₂Z₃

En clair message giving a general review of the weather in the Eastern and Western Baltic and North Sea derived from the latest a.m. ob. and a forecast for the eastern part of the German Baltic Coast for the ensuing 24 hours. This message will not exceed 20 words, and is charged for

Storm warnings (*en clair*) issued by the Danzig Free State ob. are transmitted on request

BBBDD Fw₁w₁TT c₁b₃W₃VP AN₁aNhR₁R₁m₂m₂Z₃BBBDD Fw₁w₁TT c₁b₃W₃VP AN₁aNhBBBDD Fw₁w₁TT c₁b₃W₃VP AN₁aNhR₁R₁m₂m₂Z₃

NOTE: On Sundays and holidays the 0735 message only is sent

DENMARKLyngby (near Copenhagen),
OXE, 3,760 c.w.

0735

0700

S.

N.I.C.

SYNOPTIC REPORTS.

"Meteo Danois"

(01, 02) InIn BBBDD FwwTT cbWVH

ALaNH RRSVsr C₁ddVV

(03, 04, 05) InIn BBBDD FwwTT cbWVH

ALaNH RRSVsr

"Meteo Danois"

(01, 02) InIn BBBDD FwwTT cbWVH

ALaNH C₁ddVV

(03, 04, 05) InIn BBBDD FwwTT cbWVH

ALaNH.

Same form as 0735 message above.

Notes: (1) ob. omitted from one message are transmitted at the beginning of the next and the time of ob. is indicated by adding hour of ob. to index number of station.

(2) Reports from ships are sometimes added to above messages in code, "Navires"
PQLLL IIIIGG BBDDF wvwKd CNTTT
Wrttt

(3) Storm warnings are issued, when necessary, after any of the above messages, and are preceded by the word "Tempête"

Stations:

01 Copenhagen

02 Skagen

03 Hanstholm

04 Blaavands Huk

05 Hammeren

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
DENMARK—contd.					
Lyngby (near Copenhagen), OXE, 2,400 R/T	0930 1530 2045	— — —	W.R. " "	p.l. " "	A brief message concerning wind conditions and temperature is sent in Danish (only in summer and autumn).
Copenhagen, OXA, 600 sp.	0300 0700 1100 1500 1900 2300	— — — — — —	W. W. " " " "	— — — — — —	A summary of ice conditions in Danish waters, covering region of Cattegat and Baltic, is transmitted <i>en clair</i> (English), during the winter months. (See Hydrographic Section.)
Blaavand, OXB, 600 sp. ..	request 0100 0500 0900 1300 1700 2100 request	— — — — — — —	W.R. " " " " " "	p.l. " " " " " "	Furnishes to ships on request and on payment of a charge of 4.50 francs a report for the North Sea and Skagerrak. The message is sent <i>en clair</i> (English).

DANISH GALE WARNINGS: CODES.—Gale warnings and information regarding unsettled atmospheric conditions are broadcast by Blaavand and Copenhagen W/T stations in the form:

Danish gale-warning XXXXXX, where XXXXXX represents a group of six numerals giving the nature of the warning according to the under mentioned codes from the following areas:—

- (1st) West coast of Denmark (West Jutland south of Limfjord, and adjacent parts of the North Sea).
- (2nd) Skagerrak (North Jutland, Skagerrak, and adjacent parts of the North Sea).
- (3rd) Kattegat (including islands and surrounding coasts).
- (4th) Western Baltic (west of Gjedser).
- (5th) Baltic, between Gjedser and Bornholm.

Code.	Signification.	Code.	Signification.	Code.	Signification.
0	No Warning.	4	Strong winds from S.	8	Strong winds from N.
1	Strong winds from N.E.	5	" " " S.W.	9	Strong winds, direction uncertain.
2	" " " E.	6	" " " W.		
3	" " " S.E.	7	" " " N.W.		

If a warning is issued for one or more of the five areas, the sixth figure of the group will give the following additional particulars:—

Code.	Signification.	Code.	Signification.
0	Strong wind probably of short duration.	3—5	Direction of wind changing to left.
1	" " " long	6	Strong wind probably of short duration.
2	No information regarding probable duration.	7	" " " long
0—2	Direction of wind changing to right.	8	No information regarding probable duration.
3	Strong wind probably of short duration.	9	Information regarding probable duration or change in direction not yet available.
4	" " " long		
5	No information regarding probable duration.		

NOTE.—These warnings are not only issued when there is a real danger of strong winds, but also when the outlook is so threatening that the Meteorological Institute considers it advisable to draw attention to unsettled weather conditions. In the latter case the group 000009 is always given.

(1)	(2)	(3)	(4)	(5)	(6)
EGYPT					
Cairo, Royal Air Force, GHK, 1,800 c.w.	0800	—	F.	p.l.	<i>En clair</i> forecast for Egypt and Palestine for 24 hours (<i>i.e.</i> , from 0800-0800 G.M.T.)
	1030	See Stations	S.	N.I.C.	InIn BBBDD Fwcb

SYNOPTIC REPORTS.

NOTES: (1) Late readings will be included in the broadcast for the following day prefixed by the group:—JJZZZ where JJ is the date of the readings.

(2) These broadcasts are discontinued during the settled weather of the summer months, usually June to September, inclusive.

Station.	Time of ob. G.M.T.	Station.	Time of ob. G.M.T.	Station.	Time of ob. G.M.T.	Station.	Time of ob. G.M.T.	Station.	Time of ob. G.M.T.
02 Aboukir	0600	12 Baghdad	0500	21 Malta	0700	28 Sollum	0600	35 Port Said	0600
03 Amman	0500	13 Mosul	0500	24 Candia	0600	29 Mersa-Matruh	0600	36 Suez	0600
05 Cairo	0600	14 Shaibah	0500	25 Athens	0700	32 Qasr el Gebali	0600	37 Tor	0600
07 Abu Sueir	0600	18 Ramadi	0500	26 Limassol	0600	33 Assuit	0600	38 Gaza	0600
11 Ramleh	0600	19 Kirkutt	0500	27 Suwa	0600	34 Aswan	0600	39 Haifa	0600

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
ESTHONIA (1) Haapsalu, AZI, 3600 c.w.	(2) 0725 2015	(3) 0700 1100 1900	(4) S. S.	(5) N.I.C. N.I.C.	(6) SYNOPTIC REPORTS. "Météo Eesti" InIn BBBDD FwwTT cbbRR MmmW "Météo Eesti" as for 0725 message above. The max., min. and rainfall readings refer to the period since last ob. Stations: 01 Reval, 02 Dorpat, 03 Filsand, 04 Hungerburg
FAROE ISLANDS Thorshavn, OXJ, 600 sp. ..	request	—	—	p.l.	Message contains a brief repetition of report published by the Thorshavn Meteorological station. The charge for each message is 1 franc.
FINLAND Sandhamn, OJA, 5,500 c.w.	0835 1455 1955	0700 0700 1200 1900	S. U.W. S. S.	N.I.C. " " "	SYNOPTIC REPORTS. "Météo Finland" InIn BBBDD FwwTT cbWVH ALaNh RRmmr "Pilot" InIn h,ddvv h,ddvv InIn BBBDD FwwTT cbWVH ALaNh followed by ice report (see Hydrographic Section). InIn BBBDD FwwTT cbWVH ALaNh RRMMr NOTES: (1) In U.W. reports wind speed (vv) is given in metres per sec. (2) Storm warnings are also sent on request. Stations:— 01 Helsingfors (C), 02 Sortavala (C), 03 Kuopio (L), 04 Vaasa (C), 05 Sodanukylä (L), 06 Kajaani (L), 07 Jammersfors, 08 Abo, 09 Inari.
FIJI ISLANDS (See under South Pacific Ocean)					
FRANCE Brest, FUE, 2,800 c.w. ..	0150 0750 0950 1350 1850 2145	— — — — — —	S. " " " " —	— — — — — —	SYNOPTIC REPORTS. "Météo Brest" Synoptic report for Brittany do. do. do. do. do. do. (on 3,300 metres c.w.) "Météo Brest" STATIONS: 011 Brest Naval College 161 St. Mathieu 162 Ushant
Cherbourg, FUC, 3,300 c.w.	0105 0715 1315 1815	0100 0700 1300 1800	S. U.A. S. S.	— — — —	"Météo Cherbourg" do. do. do. do. do. do.
Dijon, FND, 1,350 c.w. ..	0516 0716 0916 1116 1316 1516 1816	— — — — — — —	S. S. S. S. S. S. S.	— — — — — — —	STATIONS: 05 Cherbourg Ob. 55 The Hague for Eastern France do. do. do. do. do. do. (on 1,200 metres c.w.) do. do. do. do. (on 1,200 metres c.w.)
Le Bourget, FNB, 1,680 c.w.	0952 1450 1544 1550 1650 1750 1950	— — — — — — —	S. — S. — — — —	— — — — — — —	Synoptic report for Paris and Normandy Aviation Report in Code Paris district report Notice to aviators General weather report for the night. Forecast for next day Aviation report in code (summer only)

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
FRANCE—contd.					
Marignane, FNM, 1525 R.T	0820	—	F.	p.l.	Forecast for the southern and south-eastern areas of France
	—	0700	S.	"	State of sky, temperature, wind, state of sea in the western portion of the Mediterranean
	1920	—	F.	"	Forecast for the ensuing 24 hours for S. and S.E. France
	—	1800	S.	"	General meteorological situation in the western portion of the Mediterranean and changes observed during the course of the day
Marignane, FNM (or FOM), 1,525 c.w.	0840	0700	S.	French met. see notes	(1) " Météo Méditerranée (land ob.) InInIn BBDDF PTTcN bbSV ₁ (2) " Navires " InIn PQLLL III GG BBDF PP ₁ VSV A ₁ nA ₂ bb Repeat of above message with ob. for 1300 do. do. do. do. 1800 NOTES: (1) P is replaced by W ¹ (old international code) for station 22 and by W (international code) for station 49 (2) When there are no ships' ob. for transmission the words "Navires nil" will be sent (3) These reports are sometimes transmitted by Marignane (Gignac) call FOM
	1440	1300	"	"	
	1940	1800	"	"	

STATIONS:

022 Genoa	086 Valencia	092 Antibes	098 Pertusato
030 Mahon	087 Cap Béar	093 Iles du Levant	099 Algiers
047 Oran	088 Cette	094 Cuers	100 Cap Falcon
049 Malta	089 Montpellier	095 Ajaccio	101 Croisette
053 Bizerta	090 Marignane	096 Cap Corse	102 St. Raphael
064 Barcelona	091 Toulon	097 Iles Sanguinaires	103 Taranto

(1)	(2)	(3)	(4)	(5)	(6)
Marignane, FNM, (or FOM), 1,525 c.w.	0523	—	S.	—	Synoptic report for S.E. France
	0723	—	S.	—	do. for S.E. France and Corsica
	0921	—	S.	—	do. do. do.
	0947	—	U.A.	—	U.A. ob. S.E. France and Corsica
	1123	—	S.	—	Synoptic report for S.E. France and Corsica
	1323	—	S.	—	do. do. do.
	1523	—	"	—	do. do. do.
	1823	—	"	—	do. do. do.
Metz, YC, 3,000 c.w.	0528	—	S.	—	Synoptic report for Eastern France and the Rhine
	0728	—	"	—	do. N.E. France and the Rhine
	0933	—	"	—	do. do.
	1125	—	"	—	do. N.E. France
	1328	—	"	—	do. Eastern France and the Rhine
	1528	—	"	—	do. N.E. France.
	1828	—	"	—	do. N.E. France and the Rhine
Porquerolles (Toulon), FUQ (or FUT), 3,300 c.w.	0145	—	S.	—	Météo Toulon (occasionally ships)
	0750	—	S.	—	do. do.
	0950	—	S.	—	do. do.
	1050	—	S.	—	do. do.
	1350	—	S.	—	do. do.
	1900	—	S.	—	do. do.

STATIONS:

02 Bayonne	21 Toulouse	33 Montélimar	59 Cap Corse (SV ¹)
12 Nîmes	23 Antibes	47 Pic du Midi	60 Pertusato
14 Montpellier	25 St. Raphael (SV ¹)	51 I. du Levant (SV ¹)	80 Pau
16 Perpignan	26 Ajaccio	55 Istres	81 Cap Béar (SV ²)
20 Toulon (SV ¹ from Sicé)	31 Marignagne (SV ¹ from Croisettes)	58 Sanguinaires (SV ¹)	82 Cette (SV ¹)

(1)	(2)	(3)	(4)	(5)	(6)
Toulouse, FNT, 1,525 c.w. . .	0505	—	S.	—	Synoptic Report for S.W. France
	0708	—	S.	—	do. do. do. do.
	0908	—	S.	—	do. do. do. do.
	1108	—	S.	—	do. do. do. do.
	1308	—	S.	—	do. do. do. do.
	1508	—	S.	—	do. do. (on 1,550 metre)
	1808	—	S.	—	do. do. do. do.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
FRANCE — ⁽¹⁾ <i>contd.</i>	(2)	(3)	(4)	(5)	(6)
Toulouse, FNT, 1,525 R/T ..	0742 1842	— —	F. F.	p.l. p.l.	Forecast for S.W. France Forecast for S. and S.W. France
Tours, YO, 1,250 c.w. ..	0528 0728 0933 1050 1128 1328 1528 1828	— — — — — — —	S. S. S. S. — S. S.	— — — — — — —	Central France and Brittany (occasional ships) Central France do. do. Repeat of 0933 message. Central France. Central France and Brittany Central France Central France and Brittany
Eiffel Tower, FL, 2,600 c.w. . .	0650 1135 1142 2220	— — — —	— — — —	— — — —	General met. report for France Forecast in code General report, in plain language Forecast in code
FRENCH NATIONAL SYNOPTIC MESSAGES.					
Eiffel Tower, FL, 7,300 c.w. (6,500 c.w. in case of break- down)	0220	0100 0100 0100 0100	S. U.A. U.A.T. S.	French Met. Special Special N.I.C.	(1) "Météo France" (01-48 except 04) InIn BBBTT cbbmm DDFNV (2) "Pilot" InInGG h ₁ d ₁ d ₁ ff h ₁ d ₁ d ₁ ff, etc. (3) "Temp" InInGG BBTH BBTH, etc. (4) "Navires" InInPQLLL IIIIGG BBDDF wwVS ₁ s A ₁ nA ₂ NP qqr ₁ P ₁ TTcbb for vessels in the Atlantic InIn PQLLL IIIIGG BBDDF PP ₁ VS _N A ₁ nA ₂ bb for vessels in the Western Mediter- ranean When ob. are too numerous, they can be given in the abridged form: InIn PQLLL IIIIGG BBDDF preceded by the words "code abrégé" (1) "Météo France" (01-48 except 04) InIn BBBTT cb ₁ b ₁ j DDENV ddfnh w ₁ w ₁ PA ₁ A ₂ RRd ₁ (2) "Pilot" as for 0220 (2) message (3) "Temp" as for 0220 (3) message (4) "Météo Suisse, Belgique, Hollande" (04 and 51-64), InIn BBBDD FwwTT cbWVH ALa _N h RRmmr C ₁ ddVV (5) "Navires" same form as part of 0220 message
	0820	0700 0700 0700 0700	S. U.A. U.A.T. S.	French Met. special special N.I.C.	(1) "Météo France" (01-48 except 04) InIn BBBTT cb ₁ b ₁ j DDENV ddfnh w ₁ w ₁ PA ₁ A ₂ RRd ₁ (2) "Pilot" as for 0220 (2) message (3) "Temp" as for 0220 (3) message (4) "Météo Suisse, Belgique, Hollande" (04 and 51-64), InIn BBBDD FwwTT cbWVH ALa _N h RRmmr C ₁ ddVV (5) "Navires" same form as part of 0220 message
	1420	1300 1300 1300 1300	S. U.A. U.A.T. S.	French Met. special special N.I.C.	(1) "Météo France" (01-48 except 04) InIn BBBTT cb ₁ b ₁ (SV _s) DDFNV ddfnh w ₁ w ₁ PA ₁ A ₂ (2) "Pilot" as for part (2) of 0220 message (3) "Temp" as for part (3) of 0220 message (4) "Météo Suisse Belgique Hollande" (04 and 51-64) same form as part (4) of 0220 message (5) "Météo Suisse Belgique Hollande" (04 and 51-64) InIn BBBDD FwwTT cbWVH ALa _N h C ₁ ddVV (6) "Navires" same form as part (4) of 0220 message
	1920	1800 1800 1880 1800	S. U.A. U.A.T. S.	French Met. special special N.I.C.	(1) "Météo France" (01-48 except 04) InIn BBBTT cb ₁ b ₁ (SV _s) DDFNV ddfnh w ₁ w ₁ PA ₁ A ₂ (2) "Pilot" same form as part (2) of 0220 message (3) "Temp" same form as part (3) of 0220 message (4) "Météo Suisse Belgique Hollande" (04 and 51-64) InIn BBBDD FwwTT cbWVH ALa _N h RRMMr C ₁ ddVV (5) "Navires" same form as part (4) of 0220 message
			O.	"	

RANCE—contd.

NOTES.—(1) Missing ob. are replaced by a hyphen.

(2) jj is replaced by MM and mm for an inland station and by SV₁ for stations marked (C).

(3) Stations marked (C) give the state of the sea and visibility seawards (SV₁) :—

Code.		Code.	
01 (off Ile d'Aix)	Included in 2nd group of observations at 0700, 1300 and 1800.	20	Included in 2nd group of observation at 0700, 1300 and 1800.
02 (off Socoa)		23 (off Antibes)	
03 (off La Coubre)		25 (off St. Raphael)	
05		26 (off Sanguinaires)	
08 (off Gris Nez)		30	Included in 5th group of observations at 0700 and 1880.
11		62	
16 (off Cap Bear)		63	

(4) 1000 and 1600 observations from Ouessant and Socoa will be added to the first of the following transmissions from Eiffel Tower after their receipt :—

1135 (2600 metres, spark). 1420 } (7300 metres, C.W.).
1920 }

(5) 2045 observations from Brest, Lorient and Cherbourg will be added to the 2100 transmission (7300 metres, C.W.).

Form of Message :—IIGG BBBTT cbbSV₁ DDFNV (ddfnh) w₁w₁PA₁A₂

(6) Some ob. from foreign ships are transmitted in an abridged form similar to that used for the International Collective report.

STATIONS.—(Stations in capitals are those usually sent).

01 ROCHEFORT (C)	16 Perpignan (C)	31 MARIGNANE (C)	45 Le Puy
02 SOCOA (C)	17 Lorient (C)	32 Metz (L)	46 Puy-de-Dôme (L)
03 BORDEAUX (C)	18 RENNES (L)	33 Montélimar (L)	47 Pic-du-Midi (L)
04 BRUSSELS (L)	19 STRASBOURG (L)	34 ROMILLY (L)	48 Mont-Aigoul (L)
05 Cherbourg (C)	20 TOULON (C)	35 Valenciennes (L)	51 ZURICH (L)
06 Clermont-Ferrand (L)	21 TOULOUSE (L)	36 ABBEVILLE (L)	52 BERNE (L)
07 DIJON (L)	22 TOURS (L)	37 NANCY (L)	53 GENEVA (L)
08 ST. INGLEVERT (C)	23 Antibes (C)	38 Saint Dizier (L)	54 LUGANO (L)
09 Limoges (L)	24 Mont Salève	39 Epinal (L)	55 SAENTIS (L)
10 LYONS (L)	25 St. Raphael (C)	40 Mulhouse (L)	61 DEBILT (L)
11 BREST (C)	26 AJACCIO (C)	41 Avord (L)	62 Helder (C)
12 Nîmes (L)	27 ARGENTAN (L)	42 Angoulême (L)	63 FLUSHING (C)
13 MAYENCE (L)	28 Amiens (L)	43 Orleans (L)	64 Groningen (L)
14 Montpellier (L)	29 Cosne (L)	44 Poitiers (L)	
15 LE BOURGET (L)	30 HAVRE (C)		

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) Eiffel Tower, FL, 7300 c.w.	(2) —	(3) —	(4) W.	(5) p.l.	(6) Storm Signals are added to any of the above messages when the forecasts show the wind to exceed 50 ft. (15 m.) per sec. = Force 7 on the Beaufort scale

For the purpose of these signals the coasts of France have been divided into the following areas :—

“Manche.”—From the Belgian frontier to the parallel of St. Helier.

“Bretagne.”—From the parallel of St. Helier to (and including) Noirmoutiers.

“Océan.”—From Noirmoutiers to the Spanish frontier.

“Roussillon.”—From the Spanish frontier to Faraman.

“Provence.”—From (and including) Faraman to the Italian frontier (including Corsica).

“Méditerranée.”—This is only used when it is feasible to send one message covering the areas “Roussillon” and “Provence.”

FORM OF MESSAGE.—The message is sent *en clair*. It commences with the name of the day of the week, the duration of time for which the warning is valid, followed by the word “Tempête,” and the probable direction from which the gale may be expected.

(1)	(2)	(3)	(4)	(5)	(6)
Eiffel Tower, FL, 115 c.w. . .	1420	0700 see notes	S.	—	“METEO LE VERRIER” Ob. from stations in Central and Western Europe and N. Africa; ob. of 0700 (local time) from stations in Eastern Europe, Siberia, Caucasus and Turkestan
	2300	1800	S.	—	“METEO MAURY” Ob. from stations in Central and Western Europe and N. Africa; and ob. from ships cruising in the eastern part of the N. Atlantic
	0400	—	S.	—	Repeat of the foregoing messages
				N.I.C.	Form of message— (Land stations) InIn BBBDD Fw'b,TT (Ship Stations) PQ'LLL IIGG BBDDF TTTw

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes
(1)	(2)	(3)	(4)	(5)	(6)
FRANCE—contd. Eiffel Tower, FL, 7,300 c.w. and 115 c.w. (simultane- ously) at 0400 and 0940; 115 c.w. at 1700 (2,600 sp. at 1005 and 1125); 7,300 c.w. at 1600 and 2100 (6,500 c.w. in case of break- down)	0400	0100	S. O. S. O.	N.I.C. " " " " " " "	INTERNATIONAL COLLECTIVE. "ONM" (1) "Météo Europe" In BBDDF wTTK'W (2) "Navires" PQ'LLL III GG BBDDF wvvKd (3) "Météo Amerique" YYGG In (or InIn or InInIn) BBD followed by the names of the stations wi highest and lowest pressure thus:— Name of station <i>en clair</i> BBDF (4) (Ships' reports) "Navires" InIn PQLL III GG BBDDF TTTw' NOTES.—(1) w' as in O.I.C. (2) Q" = Quarter of Globe in <i>special co</i> as follows:— <div> <div>Code</div> <div>Fig. Lat. Long.</div> <div>1 N. W.</div> <div>2 N. E.</div> <div>3 S. W.</div> <div>4 S. E.</div> <div>Bar. in mb.; Temp. in ° F.</div> </div> <div> <div>Code</div> <div>Fig. Lat. Lon.</div> <div>5 N. W.</div> <div>6 N. E.</div> <div>7 S. W.</div> <div>8 S. E.</div> <div>Bar. in mb. or mm. Temp. in ° C.</div> </div>

NCE—contd.

IONS : EUROPEAN (never more than 60 of the following are sent).

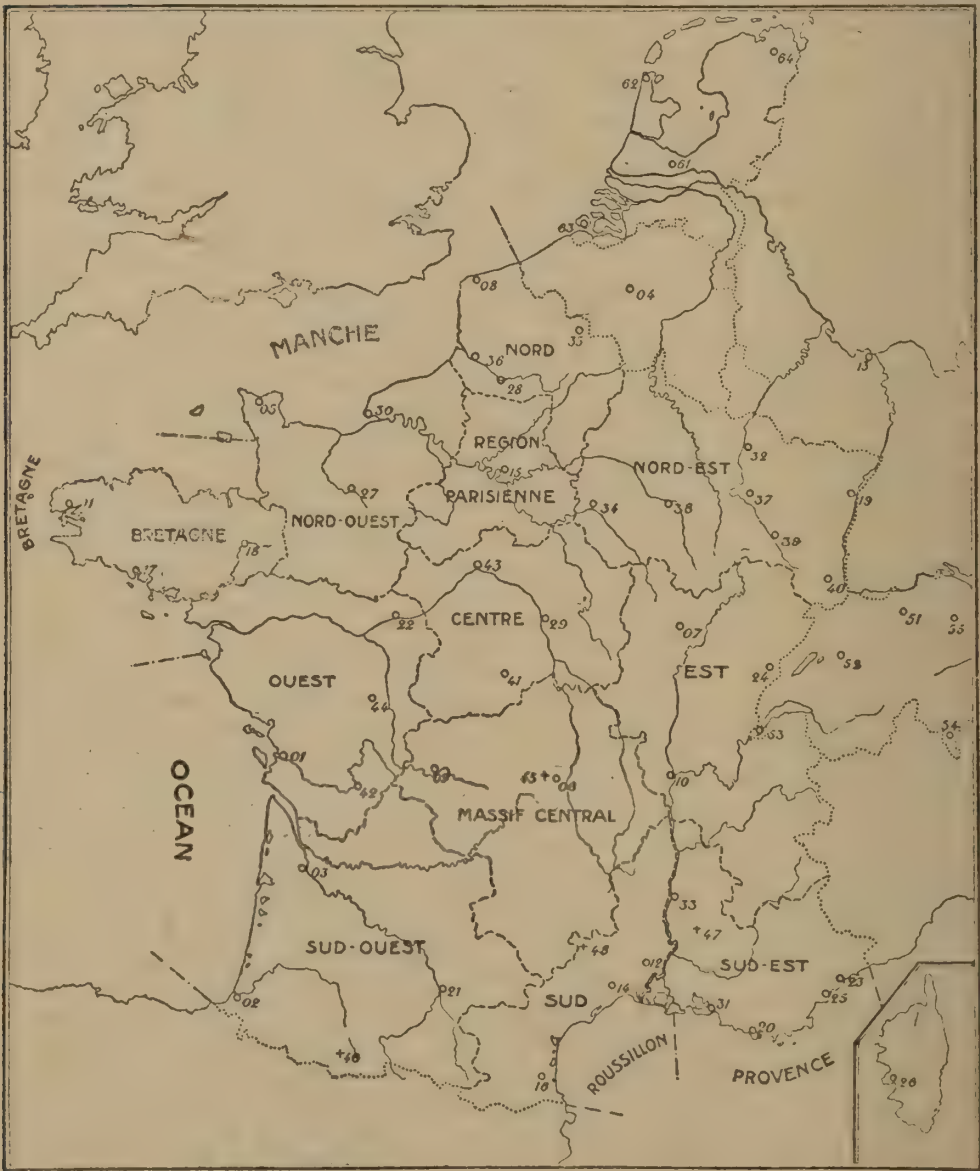
Paris	18	Prague	35	Rome	52	Sofia	69	Valladolid
Madrid	19	Ingoy	36	London (Croydon)	53	Bizerta	70	Petrograd
Vienna	20	Seydistjord	37	Hamburg	54	Tripoli	71	Sevastopol
Stockholm	21	Prerov	38	Bordeaux	55	Agadir	72	Canea
Lerwick	22	Genoa	39	Brussels	56	Athens	73	Jan Mayen
Lyons	23	Lemberg	40	Valencia	57	Funchal	74	Cordoba
San Fernando	24	Copenhagen	41	Rabat	58	Tangiers	75	Orenbourg
Munich	25	Perpginan	42	Lisbon	59	Belgrade	76	Venice
Haparanda	26	Lister	43	Horta	60	Pertusato	77	Damascus
Thorshavn	27	Corunna	44	Messina	61	Florence	78	Mygbugten
Brest	28	Aspio	45	Reykjavik	62	Corfu	79	Muslimie
Algiers	29	Helsingfors	46	Helwan	63	Magdeburg	80	Waigatch
Warsaw	30	Mahon	47	Oran	64	Barcelona	81	Spitzbergen
Bronnoy	31	Budapest	48	Cassel	65	Moscow	82	Astrakan
Renfrew	32	Holyhead	49	Malta	66	Deir-es-Zoor	83	Omsk
Bucharest	33	Zurich	50	Constantinople	67	Limassol	84	Kiev
Tunis	34	Utrecht	51	Taranto	68	Malin Head	85	Port Etienne

ORTH AMERICAN.

BI Belle Isle	LP Le Pas	K Key West	SLC Salt Lake City	DI San Diego
J St. John's N.F.	ED Edmonton	LR Little Rock	LH Helena	FW Fort Diego
S Sydney N.S.	T Nantucket	NV Nashville	DV Denver	EP El Paso
P Father Point	WA Washington	V Cleveland	RO Roseburg	JU Juncau
N Parry Sound	H Hatteras	CH Chicago	TAT Tatoosh	TN Tanana
R White River	C Charleston	DU Duluth	SF San Francisco	DH Dutch Harbour
VI Winnipeg	B Bermuda	HN Huron		

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
el Tower, YA2, 2,100 c.w.	0542 0550	0100	S. S.	N.I.C.	Synoptic report in code for Paris Repeat of European portion of International Collective Report transmitted by Eiffel Tower at 0400 Forecast for the day Synoptic report in code for Paris and Normandy do. do. do. EUROPEAN WEATHER REPORT AND FORECAST Forecasts valid during the day; advices for certain aerial routes Forecasts for areas (valid during the afternoon), the actual state of the weather (at 0700), and changes in general atmospheric pressure; forecasts of wind for the coastal areas (valid during the afternoon and night until 7 a.m.); warnings of storms on the coasts Forecasts for areas valid for the night EUROPEAN WEATHER REPORT AND FORECASTS FOR THE FRENCH COASTS Actual state of the weather at 1800, and probable changes in the general atmospheric situation; forecasts of wind for the coasta areas (valid during the following day up to 6 p.m.) and warnings of storms AVIATION SYNOPTIC MESSAGES. "Météo Phisérar" [0300] (1) "PLBA" xInIn (Vs) wwVhL NDDFW (2) GG25 xInIn wwVhL NOTES: (1) ‡ means sent during summer months only (2) x is a check figure, and is the units digit in the sum of the figures wwVhL (2) Same form as 0328 message [0500] (1) "PLBA" x InIn(Vs) wwVhL NDDFW (2) "Pilot" InIn h1ddVV h1ddVV, etc. (3) Same form as Part (2) of 0328 message (4) Ob. at stations on aerial routes other than Paris-London, Brussels-Amsterdam in special code [0600] (1) Same form as Parts (1), (2) and (4) of 0528 message
el Tower, FL, 2,600 R/T	0640‡	—	F.	p.l.	
ese messages are not mitted on Sundays	1115‡	—	F.	"	
	1900	—	F.	"	
	2210‡	—	F.	"	
Bourget (Paris), FNB, 680 c.w.	0328‡	0300	S.	N.I.C.	
These messages are dis- tinued during the winter aths	0428‡ 0528	0400 0500	S. S.	N.I.C. N.I.C.	
			U.W. S.	" "	
	0628	0600	S.	N.I.C.	
			U.W.		

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes
(1) FRANCE—contd.	(2)	(3)	(4)	(5)	(6)
Le Bourget (Paris) FNB, 1680 c.w.	0728	0700	S.	N.I.C.	[0700] (1) " PLBA " (15, 08 and 35) InIn(V) BBBDD FwwTT cbWVH ALaNh CaddL (36, 53, 54, 30) x InIn(Vs) wwVhL NDDE CaddF,S
	0828	0800	S.	N.I.C.	(2) Same form as Part (2) of 0328 messa
	0928	0900	S.	N.I.C.	(3) Same form as Part (4) of 0528 messa
			U.W.		Same form as 0628 message
	1028	1000	S.	N.I.C.	Same form as Parts (1), (2) and (3) of 05
	1128	1100	S.	N.I.C.	message
	1228	1200	S.	N.I.C.	Same form as 0728 message
			U.W.		Same form as 0628 message
					Same form as 0528 message



Forecast regions and Coastal areas of France. The index numbers refer to stations appearing in the Synoptic Reports issued from the Eiffel Tower.

STATIONS: 15 Le Bourget, 08 Calais (St. Inglevert), 36 Abbeville, 35 Valenciennes, 30 Le Havre, 53 Beauvais, 54 Compiègne.

FORECASTS: These forecasts are now given in code consisting of six groups (or less) of five figures. This is a tr arrangement.

Country, Station, Call, Wavelength.	Time of Trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(3)	(4)	(6)
ANCE—contd. Bourget (Paris) FNB, 1680 c.w.	1328	1300	S.	N.I.C.	[1300] (1) " PLBA " (15, 08, 35, 30) InIn(Vs) BBBDD FwWTT cbWVH ALaNh CaddF/S (36, 53, 54) xInIn (Vs) wwVhL NDDFW CaddF/S (2) Same form as Part (2) of 0328 message (3) Same form as Part (4) of 0528 message Same form as 0628 message Same form as 0728 message
	1428	1400	S.	N.I.C. }	
	1528	1500	S.	" N.I.C. }	
	1628	1600	S.	" N.I.C. }	
	0750 }				
	1250 }	—	F.	p.l.	Forecasts for London-Paris-Brussels-Stras-
	1750 }				bourg aerial routes <i>en clair</i>
antes (Basse-Lande), UA, 2,800 sp.	1230	—	S.	p.l.	Broadcasts <i>en clair</i> (French) the general
			F.	p.l.	meteorological situation over North America,
					the Atlantic and Western Europe, together
					with a forecast for the benefit of shipping
Cherbourg FUC					Storm warnings preceded by the Inter-
Brest FUE			W.	p.l.	national Safety Signal as soon as received by
Lorient FUN					land line or by W/T from the Eiffel Tower
Rochefort FUR					The storm signal is repeated three times at
Porquerolles FUQ					intervals of 10 minutes
Ajaccio FUI					Cherbourg, Brest, Lorient and Rochefort
All 600 sp.					transmit signals concerning the areas Manche,
					Bretagne and Océan ; Porquerolles and Ajaccio
					transmit signals concerning the areas Roussillon
					and the Mediterranean. When the time of
					sending falls outside the watch kept by ships
					carrying a single operator the message is
					repeated at the commencement of the succeed-
					ing watch.
FRENCH INDO-CHINA					
Port Bayard, HVH, 1,800 ..	0300	—	—	—	} Ob. made at the Central Ob., Fu-Lien
	1330	—	—	—	
Li-Kok, HVP, 600	0300	—	—	—	} Ob. made at the Central Ob., Fu-Lien
	1330	—	—	—	
Hanoi, HVA, 600	0230	—	—	—	
Tien An, HVB, 1,200 sp. ..	0300	2300	S.	N.I.C.	SYNOPTIC REPORTS. BBBDDFS STATIONS: Fu-Lien Cape St. James Tien-Sha Kwang-chau-Wan NOTE: S is not sent by Kwang-chau-Wan
Litho, HVM, 600, 2,000 (normal wave is 600 metres)	0300	—	—	p.l.	} <i>En clair</i> The weather report issued by Fu-Lien Meteorological Ob. (Haifong) is also furnished on request
	1300	—	—	—	
	request	—	—	—	
Pulo Condore, HVO, 600 ..	0300	—	—	—	} Ob. made at the Central Ob., Fu-Lien
	1330	—	—	—	
Tourane, HVI, 300, 1,800 (normal wave is 300 metres)	0300	—	—	p.l.	} <i>En clair</i> message The weather report issued by Fu-Lien Meteorological Ob. (Haifong) is furnished on request
	1330	—	—	"	
	request	—	—	—	
GERMANY					
Adler Grund Light Vessel, KAG, 300 sp.	0700	—	S.	p.l.	} <i>En clair</i> message giving direction and force of wind, state of the sky and sea and visibility TTTT ₂ T ₂ T ₂ As for 0700 message above
	1000	—	S.	German	
	1600	—	"	—	
	1800	—	"	—	
Amrum Bank Light Vessel, KAF, 300 sp.	0705	0700	S.	p.l.	} <i>En clair</i> message giving wind direction and force, state of the sea, visibility and state of sky TTT T ₂ T ₂ T ₂ As 0705 message above do. do.
		0700	S.	German	
	1305	1300	S.	p.l.	
			S.	German	
	1805	1800	S.	p.l.	} As 0705 message above do. do.
			S.	German	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
GERMANY—contd.					SYNOPTIC REPORTS.
Berlin, DL, 3,300 c.w. ..	0745 1345 1845	0700 1300 1800	S. " "	German " "	BBBDD FwTTP cbbRR MMmmW V BBBDD FwTTW ₂ cbbPA ₂ BBBDD FwTTW ₁ cbb NOTE: Daily except Sundays and holiday
Breslau, BU, 1,550 c.w. ..	0755 1420 1855	0700 1300 1800	S. U.A. S. S.	German " " "	(1) BBBDD FwTTP cbbRR MMmmW (2) "Pilot" HHDDF ₁ HHDDF ₁ etc a ₁ d ₁ f ₁ ZZwVc ₂ BBBDD FwTTW ₂ cbbPA ₂ BBBDD FwTTW ₁ cbb NOTE: Daily except Sundays and holiday
Borkum, KBM, 1,250 c.w. ...	0715 1050 1315 1815	0700 1000 1300 1800	S. S. S.	German " " "	BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aN R ₁ R ₁ S ₁ VZ ₂ (also ob. from Borkum Riff Light Vessel) BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VS ₁ (also ob. from Valencia (Ireland) 50, Plymouth 72, Renfrew 74. Repeat of the Bergen 0950 (see under Norway) BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aN (also ob. from Borkum Riff Light Vessel) BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aN R ₁ R ₁ S ₁ VZ ₂ (also ob. from Borkum Riff Light Vessel)
Borkum Riff Light Vessel, KBR, 300 sp.	0710 1310 1810	0700 1300 1800	S. S. S.	German " "	NOTE: V = Visibility seawards BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aN R ₁ R ₁ S ₁ VZ ₂ BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aNh BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aN R ₁ R ₁ S ₁ VZ ₂
Cuxhaven, KBX, 600 sp. ..	request	0900	S.F.	p.l.	NOTE: V = Visibility seawards En clair message prepared by the German Sea Ob. at Hamburg, including general distribution of pressure over Europe and forecast for the North Sea
Kiel, KBK, 1,650 c.w. . .	0710 1010 1090	0700 1000 0900	W. S. S.	p.l. German met. p.l.	Storm warnings for North Sea BBBDD Fw ₁ w ₁ TT VS ₁ BBBDD Fw ₁ w ₁ TT VS ₁ En clair message giving direction and force of the wind, state of the sky, state of the sea visibility and general state of the weather at Marienleuchte (Fehmarn)
	1310 1810	1300 1800	S. S.	German met. "	BBBDD Fw ₁ w ₁ TT VS ₁ BBBDD Fw ₁ w ₁ TT VS ₁
Kiel, KBK, 600 sp. ..	1100	—	S. F.	p.l. p.l.	Stations: Bülk, Marienleuchte (Fehmarn) En clair message giving atmospheric pressure over Europe and forecast for the Western Baltic
	request	—	W.	p.l.	Storm warnings for the Western Baltic
Königsberg, KO, 2,450 c.w. ...	0805 1030 1905	0700 — 1800	S. F. W. S.	German " " " German	NOTE: (1) At the request of ships, and on payment of a charge, weather reports not exceeding 25 words are transmitted containing a general review of the weather and the latest forecast for the Western Baltic (2) Storm warnings are also transmitted immediately after being received at the W.T. station (1) BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aN R ₁ R ₁ M ₂ M ₂ Z ₂ (2) "Pilot" HHDDF ₁ HHDDF ₁ etc (3) Repeat of the Revel 0720 ob.) a ₁ d ₁ f ₁ ZZwVc ₂ En clair message giving forecast and storm warnings for the Eastern Baltic (1) BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aN R ₁ R ₁ M ₂ M ₂ Z ₂ (2) As for 0805 (2) message above (3) As for 0805 (3) message above Stations: Königsberg and Memel NOTE: Messages sent daily except Sunday and holidays
		0720 1820	U.A. U.A. U.A.	" " "	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) GERMANY—contd.	(2)	(3)	(4)	(5)	(6) LINDENBERG AEROLOGICAL REPORTS (Upper Air Reports).
Snigswüsterhausen, LP, 3,350 c.w.	0635	0100 0500 " "	S. U.W. U.A.T. F.	German met. " " p.l.	(1) BBBDD (2) (Station, <i>en clair</i>) HHDDF ₁ HHDDF ₁ etc. a ₁ d ₁ d ₁ f ₁ ZZwVc ₂ (3) (Station, <i>en clair</i>) HHTTT P ₁ P ₁ DDF ₁ HHTTT P ₁ P ₁ DDF ₁ etc. ZZwVc ₂ Summary of flying conditions, <i>i.e.</i> , upper wind, cloud, etc., with forecast for Central Germany <i>en clair</i> Exactly the same as for 0635 message above NOTE: When transmission cannot be made from LP, messages are sent by Lindenberg (LI) on a 900 c.w. wave about 0700, 0920, 1620, 2020 G.M.T.
Snigswüsterhausen, LP, 3,350 c.w.	0645	0100	S.	German met	SYNOPTIC REPORTS. (1) "Funkobs Europa" (ob. from Hamburg, England, Poland and France) InInBBB DDFw ₁ w ₁ TTc ₁ b ₃ N (1) (German Reports) InInBBB DDFw ₁ w ₁ TTc ₁ b ₃ N (followed by coast station ob.) R ₁ R ₁ S ₁ VZ ₂ (2) "Funkobs I" (ob. from Netherlands, Norway, Great Britain, Iceland, Poland, Switzerland, Belgrade, Sofia, Italy) InIn BBB DDFw ₁ w ₁ TTc ₁ b ₃ N (1) (German Reports) InIn BBB DDFw ₁ w ₁ TTc ₁ b ₃ N (2) "Funkobs II" (ob. from Netherlands, Norway, Great Britain, Iceland, Poland, Switzerland, Belgrade, Italy, Sofia) InIn BBB DDFw ₁ w ₁ TTc ₁ b ₃ N (3) "Schiff" oQ0000 λλZZ BBDDF w ₁ w ₁ VS ₂ s TTT ₂ T ₂ { A a (1) (German Reports) InInBBB DDFw ₁ w ₁ TTc ₁ b ₃ N (2) "Funkobs III" (ob. from Netherlands, Norway, Great Britain, Iceland, Poland, Switzerland, Belgrade, Italy, Sofia) InIn BBB DDFw ₁ w ₁ TTc ₁ b ₃ N
	0840	0700	S.	"	
		"	"	"	
	1440	1300	S.	"	
		"	S.	"	
			O.	German met.	
	1940	1800	S.	"	
		"	S.	"	

NOTES: (1) The time of observation is indicated in the messages by prefixing two figures, giving the hour of observation, to the index number of the first station observing at this time, *e.g.*, the group 1401 means that the observations at station 01 and the following stations were made at 1400. The group 0849, coming later in the same message, indicates that the observations at station 49 and subsequent stations refer to the time 0800. Central European time being used, one hour must be subtracted to obtain Greenwich Mean Time.

(2) Observations at stations not in the list below are often transmitted. In this case the station name is given in full.

STATIONS:

01 Borkum	11 Breslau	21 Helder	41 Tynemouth	53 Lemberg
02 Lönigen	12 Frankfurt	22 Flushing	42 Valencia	54 Pinsk
03 Hamburg	13 Karlsruhe	32 Ingöy	43 Stornoway	61 Vienna
04 Swinemünde	14 Munich	33 Valdersund	44 Holyhead	62 Budapest
05 Danzig	15 Bamberg	34 Kinn	45 Yarmouth	63 Zurich
06 Memel	16 Zugspitze	36 Röst	46 Blacksod	64 Lugano
07 Aachen	17 Kahlen Asten	37 Jan Mayen	48 Thórshavn	65 Belgrade
08 Magdeburg	18 Brocken	38 Utsire	49 Seydis Fjördr	66 Sofia
09 Berlin	19 Fichtelberg	39 Lerwick	50 Vestmanna	
10 Dresden	20 Grünberg	40 Scilly	52 Warsaw	

(1)	(2)	(3)	(4)	(5)	(6) AEROLOGICAL REPORTS.
Lindenberg, LI, 900 c.w.	0915	—	U.A.	German	(1) "Pilot" HHDDF ₁ HHDDF ₁ etc. a ₁ d ₁ d ₁ f ₁ ZZwVc ₂ (2) HHTTT P ₁ P ₁ DDF ₁ HHTTT P ₁ P ₁ DDF ₁ etc. ZZwVc ₂ As for 0915 (1) message above As for 0915 (2) message above
	1515	—	U.A.	"	
			U.A.T.	"	

Country, Station, Call, Wavelength	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
GERMANY—contd.					
List, KAL, 1,250 c.w. ..	0150	0100	S.	p.l.	<i>En clair</i> message, giving direction and force of wind, the state of the sea, visibility and state of sky off Sylt. NOTE: The 0710, 1310, 1810 messages also contain a repetition of the 0705, 1310 and 1805 reports respectively from Amrum Bank Light Vessel (q.v.)
	0500	0400	S.	"	
	0710	0700	S.	"	
	1040	1000	S.	"	
	1310	1300	S.	"	
	1640	1600	S.	"	
	1810	1800	S.	"	
	2220	2200	S.	"	
Norddeich, KAV, 1,100 sp.	0515	—	W.	p.l.	Storm warnings for the North Sea; type of disturbance, direction and force of wind (<i>en clair</i> message)
	1015	0700	S.	p.l.	(1) Surface ob. (<i>en clair</i> message) from Borkum Riff Light Vessel, Amrum Riff Light Vessel, Utsire and Tynemouth
			S.	"	(2) General review of the weather and pressure distribution
			F.	"	(3) Twelve hours' forecast for the North Sea
	1630	—	W.	"	(4) As for 0515 message above
	2130	1800	W.	"	As for 0515 message above
			S.	"	As for 1015 message above
			F.	"	do. do.
			W.	"	do. do.
			W.	"	Storm warnings broadcast immediately upon receipt

NOTE: Vessels equipped with W.T are requested to make known the Norddeich W.T Storm Signals to other ships by means of the undermentioned signals:—

During daylight the signals used by the German Storm Signal Stations should be employed, viz.:—The black ball and one or two black cones. These visual signals are also exhibited on the mizzen mast of the fishery protection boats, flags denoting the probable shift of the wind being exhibited on the foremast beside the broad pendant.

During the night the signals will be repeated by means of flashing lanterns using the following Morse signals repeated several times:—

— • • • (B) for the signal ball = force of wind 6-7.

• — Storm from the N.W.

— • " S.W.

• — " N.E.

— • " S.E.

• — • • Storm signal (any direction) = force of wind 8 or over. (This signal is the equivalent of two cones, one pointing upwards and the other down.)

No call or stop signals will be used.

(1)	(2)	(3)	(4)	(5)	(6)
Pillau, KAP, 1,650 c.w. ..	0730	0700	S.	German	BBBDD FwTTS
	1330	1300	S.	"	BBBDD FwTTS
	1830	1800	S.	"	BBBDD FwTTS
Pillau, KAP, 600 sp. ..	1130	0700	S.	p.l.	" Wetter vor aussage für die Ostliche See
			F.	"	(1) <i>En clair</i> message giving general review of the weather and forecast for the Eastern Baltic. It includes wind direction and force, state of the sea, state of sky, precipitation, fog and mist, etc., at Pillau, Brusterort, Memel and Visby
			W.	"	(2) "Sturm warnungen für die Ostliche Ostsee." Warnings for the Eastern Baltic <i>en clair</i>
					NOTE: These warnings are also sent immediately after reception at the W.T station
Pillau, KAP, 600 sp. ..	0530	—	W.	p.l.	As for 1130 (2) message above
	1730	—	W.	"	
Stuttgart, SX, 2,000 c.w. ..	0850	—	S.	German	Synoptic message containing U.A. ob.
Swinemünde, KAW, 1,000 sp.	0725	0700	S.	German	BBBDD Fw ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aN
		—	U.A.	"	R ₁ R ₁ m ₃ m ₃ Z ₂
		0700	U.A.	"	"Pilot" HHDDF HHDDF etc.
					(Adler Grund Light Vessel Ob.) a ₁ d ₁ d ₁
	1045	1000	S.	German	ZZwVc ₂
					(Repeat of Adler Grund Light Vessel's message at 1000 (q.v.))
	1325	1300	S.	"	BBBDD Fw ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aNh

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
GERMANY—contd. Swinemünde, KAW, 1,000 sp.	1645	1600	S.	German	Repeat of Adler Grund Light Vessel's message at 1600 G.M.T. (q.v.)
	1825	1800	S.	"	BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aNh R ₁ R ₁ M ₂ M ₂ Z ₂
	1800	1800 U.A.	U.A. "	"	"Pilot" HHDDF HHDDF etc. (Adler Grund Light Vessel Ob.) a ₁ d ₁ d ₁ f ₁ ZZwVc ₂
	request	—	—	p.l.	A special bulletin for the Central and Western portions of the Baltic Coast prepared by the German Sea Ob., Hamburg, at 0900 G.M.T. for which a charge is made, is transmitted on request
					NOTE: At 1200 G.M.T. Swinemünde Weather Ob. issues a forecast for the Southern Baltic which is transmitted to ships on request
					SYNOPTIC REPORTS.
Swinemünde, KAW, 1,100 c.w.	1030	0700	S.	p.l.	"Funkwetter" (1) <i>En clair</i> message giving wind direction and force, state of the sky and sea and visibility at Bülk, Adler Grund Light Vessel, Skagen and Visby
			S.	"	(2) <i>En clair</i> message giving a general review of the weather
			F.	"	(3) Forecast for the Western and Middle Baltic
			W.	"	(4) Storm warnings for the Western and Central Baltic; type of disturbance and direction and force of wind
	2145	1800	S. S. F. W.	" " " "	"Funkwetter" as for 1030 (1) message above (2) as for 1030 (2) message above (3) As for 1030 (3) message above (4) As for 1030 (4) message above
Swinemünde, KAW, 600 sp.	0530 1650	— —	W. W.	p.l. "	{ <i>En clair</i> message giving storm warnings for the Western and Central Baltic; type of disturbance, direction and force of wind
					NOTE: These warnings are transmitted twice in succession immediately after receipt
Wilhelmshaven, 3rd Entrance, KAN, 1,250 c.w.	0720 1320 1820	0700 1300 1800	S. S. S.	German met. " "	{ Repeat of corresponding reports sent out by Borkum Riff Light Vessel, Amrum Bank Light Vessel, List and Aussenjade Light Vessel W/T stations (q.v.) for the preceding even hour
PORTUGAL					
Lisbon, BWW, 3,900 c.w. (Sundays excepted)	0730 1840	0700 1800	S. S.	N.I.C. "	BBBDD FwwTT cbWVH ALaNH RRmmr SSSmgmg BBBDD FwwTT cbWVH ALaNH RRMMr NOTES: SSS = sunshine, mgmg = grass minimum temp. in whole degrees F.
UNITED KINGDOM					
London, Ministry (London), GFA, 4,100 c.w.	0850	{ 1800 0700	S.	N.I.C.	INTERNATIONAL COLLECTIVE. (1) InIn BBDDF w ₁ TTK'W, (For stations indicated * w ₁ represent present weather in O.I.C.) (2) "Horta" BBBDD Fwwmm cbWV-CNRRS InIn BBDDF w ₁ TTK' W InIn BBDDF w ₁ TTK' R

GREAT BRITAIN—*contd.*

NOTES: (1) The alternative stations in col. (2) in the list of stations below are only used when the information from the corresponding station in col. (1) is missing. If, in such a case, more than one alternative station is available the first is taken

(2) For stations thus marked X, the ob. sent in the 0850 message relate to 1800 G.M.T. of the previous day and those in the 1450 message to 0700 G.M.T. of the same day

(3) Reports from Icelandic stations are occasionally added to these messages in same code as for British Synoptic Reports (q.v.)

(4) For "Horta," pressure is in mb. and minimum temp. in degrees F.

STATIONS:—			STATIONS:—		
Column (1)			Column (1)		
01	Jan Mayen	33 Bjornoya	18	Mainz	64 Strasbourg
		34 Spitzbergen			65 Metz
02	Ingoy	35 Vardo	19	Marignane	66 Toulon
		36 Abisko			67 Le Havre
	Bronnoy	37 Rost	20	Zurich	68 Berne
		38 Valdersund			69 Geneva
04	Lister	39 Utsire	21	Corunna X	70 Madrid X
		40 Okso			71 Valladolid X
05	Kinn	41 Bergen	22	Horta X	72 Ponta Delgada X
		42 Faerder			73 Funchal X
06	Haparanda	43 Stensele	23	Berlin X	74 Hamburg X
		44 Härnosand			75 Swinemünde X
		45 Ostersund			76 Vienna
07	Stockholm	46 Wisby	24	Munich *	77 Linz X *
		47 Karlstad			78 Innsbruck X *
		48 Säma			79 Lemberg
08	Copenhagen	49 Hammeren	25	Warsaw	80 Lodz
09	Blaavands Huk	50 Hanstholm			81 Cracow X
		51 Skagen			82 Tarnow
10	Helder		26	Posen	83 Lublin X
11	Flushing	52 De Bilt			84 Pinsk X
		53 The Hague			85 Kosice
			27	Prague	86 Cheb X
13	Paris	54 Amiens			87 Stara Dala X
		55 Romilly			88 Leghorn X *
14	Brest	56 St. Mathieu	28	Genoa *	89 Florence X *
		57 Ushant			90 Taranto X *
15	Rochefort	58 Ile d'Aix	29	Rome X *	91 Pesaro X *
		59 Toulouse			92 Palermo X *
16	Bayonne	60 Bordeaux	30	Malta	93 Cagliari X *
		61 Cherbourg	31	Helwan	94 Limassol *
17	Lyons	62 Dijon	32	Gibraltar	95 Lisbon X
		63 Valenciennes			

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Air Ministry (London), GFA, 4,100 c.w.	0200	0100	S.	N.I.C.	BRITISH AND ICELANDIC SYNOPTIC. (1) (01-78) InIn YYGG BBBDD FwwT cbWVH ALAnh C ₁ ddVV
		0100	U.W.	"	(2) "Pilot" YYGG InIn h ₁ ddv h ₁ ddv etc.
		0100	U.A.T.	"	(3) "Temp" InIn YYGG BBTTH BBTTH etc.
In cases of breakdown or other delay in commencing transmission on 4100 metres, should transmission not have commenced at the expiration of 10 minutes after the scheduled time, the message will be sent on 1400 metres, 10 min. after the routine time)	0600	0100	O.	"	(4) "Ships" InIn PQLLL MGG BBDD wwwKd y ₁ y ₂ y ₃ y ₄ y ₅ x ₁ x ₂ x ₃ x ₄ z CNWUX, TTItx (1) (01-78) InIn BBBDD FwwTT cbWVH ALAnh C ₁ ddVV
		2300	S.	"	(2) "Horta" BBBDD FwwTT cbWVH CN---
		0100	U.W.	"	(3) "Pilot" as for Part (2) of 0200 message
		0100	U.A.T.	"	(4) "Temp" as for Part (3) of 0200 message
		—	O.	"	(5) "Ships" repeat of Part (4) of 0200 message, together with all reports from British ships for the past 23 hours, which owing to limitation of the length of messages were not issued in the 0800, 1400 and 1900 messages of the preceding day

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
EAT BRITAIN—contd.					
Ministry (London), G.F.A., 100 c.w.	0800	0700	S.	N.I.C.	(1) (01-78) InIn YYGG BBBDD FwwTT cbWVH ALANh RRmmr C ₁ ddVV (for Inland Stations) (01-78) InIn YYGG BBBDD FwwTT cbWVH ALANh RRSVsr C ₁ ddVV (for Coastal Stations) (91 and 95) InIn BBcbb BBBDD FwwTT cbWVH ALANh RR--r (92, 93, 94, 96) InIn BBcbb BBBDD FwwTT cbWAN
		0700	U.W.	"	(2) Same form as Part (2) of 0200 message
		0700	U.A.T.	"	(3) Same form as Part (3) of 0200 message
		—	O.	"	(4) Same form as Part (4) of 0200 message
	0840	0700	S.	"	Repeat of 0800 message
	1050	1000	S.	"	(1) (03, 50, 72 and 74) YYGG InInBBBDD FwwTT cbWVH ALANh C ₁ ddVV
		0800	"	"	(2) "Horta" BBBDD Fwwmm cbWVH CNRRS
		1000	"	"	(3) Delayed Icelandic ob.
		—	O	"	(4) "Ships" same form as Part (4) of 0200 message.
	1400	1300	S.	"	(1) (01-78) InIn YYGG BBBDD FwwTT cbWVH ALANh C ₁ ddVV (91 and 95) InIn YYGG BBBDD FwwTT cbWVH ALANh C ₁ ddVV (92, 93, 94, 96) InIn BBBDD FwwTT cbWAN
		1300	U.W.	"	(3) Same form as Part (2) of 0200 message
		1300	U.A.T.	"	(3) Same form as Part (3) of 0200 message
		—	O.	"	(4) Same form as Part (4) of 0200 message
	1650	1600	S.	"	(1) (03, 50, 72 and 74) same form as Part (1) of 1050 message above.
		"	"	"	(2) "Horta" same form as Part (2) of 1050 message above.
		—	O.	"	(3) "Ships" same form as Part (4) of 1050 message above.
	1900	1800	S.	"	(1) (01-78) InIn YYGG BBBDD FwwTT cbWVH ALANh RRMMr C ₁ ddVV (for Inland Stations) (01-78) InIn YYGG BBBDD FwwTT cbWVH ALANh RRSVsr C ₁ ddVV (for Coastal Stations) (91 and 95) InIn BBBDD FwwTT cbWVH ALANh RR--r C ₁ ddVV (92, 93, 94, 96) InIn BBBDD FwwTT cbWAN
		1800	U.W.	"	(2) Same form as Part (2) of 0200 message
		1800	U.A.T.	"	(3) Same form as Part (3) of 0200 message
		1800	O.	"	(4) Same form as Part (4) of 0200 message
	1940	1800	O.	N.I.C.	(1) Ship reports not previously issued since 0600
			S.	N.I.C.	(2) "Horta" BBBDD FwwMM cbWVH CNRRS
			S.	"	(3) Ob. from Icelandic stations when received too late for inclusion in 1900 message

GREAT BRITAIN—*contd.*

NOTES:

(1) In Ship's reports, llll is the longitude in degrees and tenths; also in the code for present weather, 03 = fine or fair with exceptional visibility, and 13 = cloudy or overcast, with exceptional visibility.

(2) For stations 91-96 inclusive the unit of pressure is the mm., and of temperature the degree C.

(3) Reports from stations 91-96 inclusive are usually distributed among those from British stations.

(4) Stations regularly included are printed in capital letters in the list below. If a regular station should be missing on any occasion a neighbouring station is inserted if available.

(5) Nephoscope ob. (group C₁ddVV) of medium or high cloud do not always refer to the station to which the cloud group is assigned in the synoptic message, but may have been made at a neighbouring station not included in the message if no nephoscope ob. are available from the synoptic station itself. Nephoscope ob. are usually given for more than six or eight stations, which are normally sufficient to give a representation of upper cloud motion over the British Isles.

(6) Reports received too late for inclusion in the 0800 and 1400 messages are added to the 0835 and 1400 Aviation Synoptic Reports (q.v.)

(7) Ship observations are given in the New International Meteorological Code (four groups) followed by the check figure groups and two groups for National use.

U = Unusual Phenomena reported by ships at sea.

CODE:

- 0 None of the following remarks appropriate.
- 1 Appearances indicate that a tropical storm has formed.
- 2 Appearances indicate that a tropical storm is forming.
- 3 Heavy squalls during last three hours.
- 4 Squally weather.
- 5 Barometer falling very rapidly (more than 2 millibars an hour).

- 6 Barometer rising very rapidly (more than 2 millibars an hour).
- 7 Wind has increased decidedly during the last hour.
- 8 Wind has decreased decidedly during the last hour.
- 9 Unusually red sunset (or sunrise).

(8) At British stations, for reports at the standard hours (0100, 0700, 1300, 1800 G.M.T.) the code letter for past weather W always refers to the preceding period of five, six or seven hours since the last standard hour. For reports at other hours W refers to the period since the preceding report or the preceding standard hour, whichever is shorter. In the case of past weather referred to in the specification of the present weather code ww, the period is the hour preceding the time of ob.

(9) When reports from Icelandic stations are received too late for inclusion in the synoptic message containing British ob. made at the same hour, they are added to later routine messages.

(10) The heights for U.W. are given in feet.

(11) Navigation warnings of a specially urgent nature are transmitted when necessary at the end of the 0600, 0800, 1400, 1900 and 1940 synoptic messages above.

STATIONS:

02 LERWICK (C)	31 Birr Castle (L)	54 ROSS-ON-WYE (L)	72 PLYMOUTH (C)
03 STORNOWAY (C)	33 HOLYHEAD (C)	56 Larkhill (L)	73 Portland (C)
04 WICK (C)	34 Liverpool (C)	57 Andover (L)	74 CALSHOT (C)
05 Castlebay (C)	35 Shotwick (L)	58 Farnborough (L)	75 Beachy Head (C)
06 Nairn (L)	36 Manchester (L)	60 Kew (L)	76 Dungeness (C)
07 ABERDEEN (C)	38 Spurn Head (C)	61 CROYDON (L)	77 GUERNSEY (C)
09 Leuchars (L)	41 Birmingham (L)	62 Biggin Hill (L)	78 JERSEY (C)
00 MALIN HEAD (C)	42 Castle Bromwich (L)	63 Clacton (C)	81 St. Catherine's Pt. (C)
11 RENFREW (L)	43 Nottingham (L)	64 Shoeburyness (C)	91 Thorshavn (Denmark)
12 INCHKEITH (C)	44 CRANWELL (L)	65 Grain (C)	92 Seydisfjord (Iceland)
13 Eskdalemuir (L)	45 YARMOUTH (C)	66 Lympne (L)	93 Akureyri (Iceland)
15 TYNEMOUTH (C)	50 VALENCIA (C)	67 Deal (C)	94 Isafjord (Iceland)
20 BLACKSOD POINT (C)	51 ROCHE'S POINT (C)	68 North Foreland (C)	95 Reykjavik (Iceland)
22 DONAGHADEE (C)	52 PEMBROKE (C)	70 SCILLY (C)	96 Vestmanna (Iceland)
25 Flamborough (C)	53 Leafield (L)	71 Falmouth (Pendennis) (C)	"Horta" (name in full)

The main groups of the code used by a limited number of ships for reporting to the Meteorological Office have been internationalised, ships are now able to intercept these reports.

The reports are addressed to "Weather London" (Meteorological Office, London); and to "Govt. Observer, Washington, D.C." (United States Weather Bureau). Those addressed to "Weather London" are made to Devizes W/T station (GKU), on a wavelength of 2,100 metres (c.w.). Those addressed to "Govt. Observer, Washington, D.C." are made to any of the following United States W/T stations on a wavelength of 2,400 metres (c.w.): Bar Harbour (NBD), New York (NAH), Norfolk (NAM), or Charleston (NAO). The respective transmissions take place as soon as possible after observation time.

EAT BRITAIN—contd.

Observations made between the 100 fathom line, British Islands, and Long. 40° W., are reported to "Weather London."

Observations made between Long. 40° W. and a line, Belle Isle—Virgin Rocks—Sable Island—Cape Hatteras, reported to "Govt. Observer, Washington, D.C."

The times of observations (G.M.T. civil) are :—

European land : 0100, 0700, 1300, 1800.

American land : 0100, 1300.

Ships at sea from 100 fathom line, British Islands, to Long. 40° W. : 0700, 1800.

Ships at sea from Long. 40° W. to a line, Belle Isle—Virgin Rocks—Sable Island—Cape Hatteras : 0100, 1300

Additional reports may be made to "Weather London" eastward of Long. 40° W., containing observations made at 0100 and 1300.

m of message :—

(Address PQLLL lllGG BBDDF wwvKd xxxxx yyyyy CNWUy TTtty.

mple :—

Weather London 41458 33807 24162 11804 09111 21542 67104 68691.

oded :

Meteorological Office, London. Wednesday ; Lat. 45° 48' N., Long. 33° 48' W. ; G.M.T. (civil) 0700 ; Bar. 1024 mb. ; Wind S., force 2 ; cloudy, visibility very good ; slight swell from south (column check corrected), (group check corrected) ; strato-cumulus seven-tenths ; past weather cloudy ; not unusual phenomena ; (group correct by check) ; temperature—air 68° Fahr., sea 69° Fahr. ; (an error in group 8).

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Ministry (London), GFA, 100 c.w.	0900	0700	G.	p.l.	SHIPPING REPORTS. (1) "Weather Shipping" "Inference" General summary of weather conditions over North-west Europe and adjacent seas
		0700	S. F.	N.I.C. p.l.	(2) "Station Reports" InK'wwv BBDDF (3) Forecast of wind and visibility for 12 hours following time of ob. for Western Area (4) Ditto for Southern area (5) Ditto for Eastern area (6) "Outlook." General statement as to expectation of weather after the period of the forecasts (when it can be made) As for 0900 message
	2000	1800	G.S.F.	—	(See map FOR AREAS)

NOTES : (1) During the time of S.O.S. look-out from 0915 to 0918 and from 2015 to 2018, there will be a pause in the transmission of these messages.

(2) The boundaries of the areas are defined by thick black lines and the coast line. These areas are sub-divided into districts, named after islands, rivers or banks within them, so that they may be readily memorised. The boundaries of the districts are shown by dotted lines, and should only be taken as an approximate indication of their extent. These districts are for the purpose of giving information of different weather within an area, without unduly lengthening the wording of the message.

(3) The name of the area, and, when subdivision is necessary, that of the district, will precede each forecast.

(4) Commencing on October 1st, 1924, two Northern Station reports will be added to this Bulletin. The new area will be designated "Foreign," and the stations are :—

(1) Reykjavik, Lat. 64° 09' N., Long. 21° 55' W. (2) Thorshavn, Lat. 62° 03' N., Long. 6° 45' W.
This information will not be inserted on the chart.

(5) The visibility reports from Reykjavik and Thorshavn are *landwards*.

(6) Confusion sometimes arises between the words "Ireland" and "Iceland" when used in the Weather forecasts, owing to their similarity in the Morse code. To obviate this, on and after June 1st, 1924, whenever the word "Iceland" is used it will be transmitted thus :

Iceland, Iceland,
in order to distinguish it from "Ireland" which will be transmitted :
Ireland
when describing the situation of a pressure area, etc.

GREAT BRITAIN—contd.



CHART SHOWING METEOROLOGICAL FORECAST AREAS, DISTRICTS AND OBSERVATION STATIONS.
(Adapted from Chart in Admiralty Notice to Mariners, 8th December, 1923.)

STATIONS :

- o Wick
1 Stornoway
Foreign (1) Reykjavik.
Foreign (2) Thorshavn.
- 2 Malin Head
3 Valencia
- 4 Holyhead
5 Scilly
- 6 Guernsey
7 Dungeness
- 8 Yarmouth
9 Tynemouth

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6) AVIATION SYNOPTIC.
Air Ministry (London), GPA, 1680 c.w.	0336‡	0300	S.	N.I.C.	(1) "Météor" [0300] (61, 62, 66) xInIn(V wwVhL NDDFW (where x is a check figur being the units digit in the sum of the figur wwVhL) (2) "CND" (ob. at Croydon five minut before time of transmission of message) wwV (1) "Météor" [0400] (61 and 66) InIn(V BBDD FwwTT cbWVh ALaNh CaddF (62) xInIn(Vs) wwVhL NDDFW CaddF,S (2) Same form as Part (2) of 0336 messa Same form as 0336 message
‡ These messages are dis- continued during the winter months, and are not usually issued on Sundays	0436‡	0400	S.	"	
	0536‡	0500	S.	"	
	0636‡	0600	S.	"	Same form as 0336 message

GREAT BRITAIN—contd.

(3) Reports from ships at sea are added to the next hourly route report issued after they are received. C as in *Ships Code, General Synoptic issue*

(4) The word "botley" when it occurs in a message is followed by a statement in p.i. of the conditions on North Downs (Botley Hill), as viewed from Biggin Hill, when such a statement adds material information to that contained in the rest of the message.

(5) When bad weather conditions prevail on the normal air routes between Croydon and the Channel, reports from certain stations on an alternative route (Isle of Grain, N. Foreland and Deal) are included in Part (1) of the hourly messages in the form: xInInVs wwVhL

(6) When a report from Beachy Head is received too late to be included in the corresponding hourly route message, it is included in the next hourly route message issued, the time of ob. (G.M.T.) being added in a four-figure group GGgg (hours and min.) after the index numbers, thus: xInInVs GGgg wwVhL NDDFW CaddF₁S

STATIONS:

61 Croydon (L)	66 Lympne (L)	75 Beachy Head (C)	
62 Biggin Hill (L)	67 Deal (C)	76 Dungeness (C)	72 Plymouth (C)
65 Isle of Grain (C)	68 North Foreland (C)	50 Valencia (C)	74 Calshot (C)

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Air Ministry (London), GFA 4,100 c.w.	1950	1800	F.	Forecast	"Group 999" Forecast for England and Southern Scotland in special code
Niton (I. of W.) .. GNI	request	—	W. S.	code p.i.	Storm warnings <i>en clair</i> are preceded by the International Safety Signal and repeated at short intervals ten times on full power
Land's End GLD	"	—	"	"	These stations transmit weather reports <i>on demand</i> at the following charges:—
Fishguard GRL	"	—	"	"	(a) Where the information is supplied by the station itself, a charge of 5s. will be made for each message
Seaforth (Liverpool) GLV	"	—	"	"	(b) Where the information is not available at the station, but has to be obtained special from some other source (e.g., the Meteorological Office, London), the charge for each message will be 7s. 6d., which amount includes cost of inland transmission
Port Patrick GPK	"	—	W.	"	
Wick GKR	"	—	W.S.	"	
Cullercoats (Newcastle) GCC	"	—	W.	"	
Grimsby GKZ	"	—	"	"	
North Foreland .. GNF	"	—	"	"	
Valencia GCK	"	—	W.S.	"	
Malin Head GMH	"	—	"	"	
all 600 sp.					

NOTE: A gale warning is issued when the strength of the wind is expected to reach or exceed 40 miles per hour (Force 8 on Beaufort Scale). The warnings are sent by the Meteorological Office, Air Ministry, to those stations which lie within about 150 miles of the area threatened.

Commencing on September 1st, 1924, the gale warnings broadcasted will be amplified to give the direction in which gales are moving. The messages will not be changed in any other particular. The following is an example of the revised form of message:—

"Gale warning. Deep depression off N.W. Ireland moving East. Gales from S.E. backing North probable North of lat. 54°. Southerly gales veering N.W. other coasts."

WARNINGS OF SQUALLS OR THUNDER STORMS.

Warnings of *squalls* or *thunder storms* which are reported from stations lying on or near aerial routes are broadcasted from the Air Ministry (call signal GFA) on a wavelength of 1,400 metres.

(1)	(2)	(3)	(4)	(5)	(6)
Devizes GKU, 2100 c.w. ..	"	—	S.	p.i.	This station transmits weather reports <i>on demand</i> (as above)
	(See notes)	0100	O.	N.I.C. (ships)	Reports sent to the Meteorological Office, Air Ministry, from ships at sea
		0700	O.	"	NOTE: Ships transmit their reports as soon after the ob. hours as possible
		1300	O.	"	
		1800	O.	"	

GREECE

(1)	(2)	(3)	(4)	(5)	(6)
Athens, SXG, 3,600 sp. ..	0945	0600	S.	N.I.C.	"Météo Athénés 1" (or only)
		a.m. } ob. }	S.	O.I.C. (mod.)	(1) BBBDD FwwTT cbWVH ALAN RRmmr C ₁ ddv
	1545	1200	S.		(2) (Other stations) InIn BBDD FWT gbbR
					"Météo Athénés 2" as for 0945 message above.

SYNOPTIC REPORTS.

REECE—contd.

NOTES : R has same meaning as in N.I.C., the period being only the preceding 12 hours in the case of stations marked thus .*

STATIONS :

Athènes*	11 Argostoli*	21 Port-Said	31 Djedeide	41 Constantinople
Corfou*	12 Calamata*	22 Siouh	32 Lattaquéé	42 Belgrade
Zante*	13 Larissa*	23 Assiut	33 Bucarest*	43 Sarajevo
Salonique*	14 Missolonghi*	24 Jaffa	34 Constanza*	44 Crickvenica
Volos*	15 Nauplie*	25 Gaza	35 Sulina*	45 Zagreb (Agram)
Mitylène*	16 Naxos*	26 Damas	36 Chissinau*	46 Angone
Andros*	17 Hierapetra*	27 Muslimic	37 Jassy*	47 Tarente
Santorin*	18 Yanina*	28 Deir es Zoor	38 Tenesvar*	48 Messine
La Cannéa*	19 Alexandrie	29 Palmyre	39 Sibiu*	49 Malta
Candie(HéracléeCrête)*	20 Limassol	30 Ksara	40 Sofia	50 Bizerta

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Athens, SXA, 600 sp.	1100	0800	S.	p.l.	Meteorological report of the Athens Observa- tory for ships, containing :— (1) State of the sea and sky for the Ægean and Ionian seas. (2) Direction and force of the wind at Crete, Cyprus, Alexandria and Malta. General information regarding gales
Londoniki, SXC, 7,000 c.w.	0330 0730	— —	W. —	p.l. —	
HAITI REPUBLIC					
Port au Prince, NSC, 2,255 sp.			W.	p.l.	Hurricane warnings and advisory messages relating thereto are transmitted when issued by the Washington Weather Bureau, and repeated every 4 hours
HAWAIIAN ISLANDS					
Honolulu (Pearl Harbour), NPM, 2,255 sp.	0630 1830 2230	0600 1800 2200	W.R. F. W.	p.l. p.l. p.l.	Forecast <i>en clair</i> for Hawaiian Islands and neighbouring ocean areas NOTE : These reports also issued on request
HOLLAND					
Roosterberg, STB, 1,900 c.w.	0730	0700	S.	N.I.C.	SYNOPTIC REPORTS. " Météo Holland " (1) (03 only) In In BBBDD FwwTT cbWVH ALaNh RRmmr C ₁ ddVV (or and 02) In In BBBDD FwwTT cbWVH ALaNh RRSVsr C ₁ ddW (2) " Pilot " (or and 03) In In h ₁ ddvv h ₁ ddvv, etc. (3) " Temp " (or and 03) In In ddt BBTTH BBTTH, etc. (1) In In BBBDD FwwTT cbWVH ALaNh C ₁ DDVV (2) Same form as 0730 (2) message above (3) Same form as 0730 (3) message above. Same form as 0730 message above NOTES : (1) In part (3) of above messages, dd = day of month and tt = hour of day (G.M.T.) of ob. Stations : 01 Helder (C), 02 Flushing (C), 03 De Bilt (L)
			U.W.	"	
			U.A.T.	"	
	1330	1300	S.	N.I.C.	
			U.W.	"	
			U.A.T.	"	
	1830	1800	S.U.W. U.A.T.	N.I.C. —	
			S.F.	"	
			U.W.	"	
			U.A.T.	"	
Roosterberg, STB, 1,680 c.w. (1,900 c.w. for 0855 and 1505 messages only	0745 1045 1345	0700 1000 1300	S.F. — S.F.	N.I.C. — "	AVIATION SYNOPTIC REPORTS. (1) " Météo Holland " (1-3) (0700) In (Vs) BBBDD FwwTT cbWVH ALaNh CaddF ₁ S (4 and 7) In BBBDD FwwTT cCWxH xxxNx (5-6) (0700) In (Vs) wwVhL NDDFWs (2) " Pilot " In h ₁ ddvv, h ₁ ddvv, etc. (3) " Temp " In ddt BBTTH BBTTH
			U.W.	"	
			U.A.T.	"	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
HOLLAND — <i>contd.</i>	0645 0845 1145 1245 1445	0620 0820 1120 1220 1420	S. F. — — —	— — p.l. — —	(1) (5-6) (0620) in (Vs) wwVhL NDDEF (2) Forecast for London-Amsterdam Route (in English). Forecast for Amsterdam- Paris Air Route (in French) and for Amsterdam- Hamburg-Berlin Air Route (in German)
	0945	0920	S. F.	N.I.C. p.l.	(1) (2, 5, 6) (0920) In (Vs) wwVhL NDDEFV (2) Revised forecast as for 0645 (3) message
	0830 1505	— —	U.W. U.A.T. U.A.T.	N.I.C. — —	"Pilot" In ddt h,ddvv h,ddvv, etc. "Temp" In ddt BBTTH BBTTH F
	*1645 *1745	1620 1720	S.F. "	N.I.C. "	
	* Only on Monday				

NOTES: (1) Inversions of temp. are given in two groups BBBTT ttthh where BBB — pressure at base of inversion.

TT = increase of temp. in degrees C (N.I.C.).

ttt = temp. at the base of the inversion in tenths of degrees C.

hh = height in decametres from the base of the inversion up to the point where the temp. begins to fall again.

(2) U.W. are from the result of a pilot balloon ascent at De Bilt and Helder (velocity given in km. hr.), and U.A.T. ob. are from results of an aeroplane ob. at Soesterberg and Helder.

(3) dd = day of month; tt = hour of day (G.M.T.).

Stations: 1 Helder, 2 Flushing, 3 DeBilt, 4 Groningen, 5 Schiphol, 6 Rotterdam Waalhaven Aerodrome, Maastricht, 8 Lightship Noord-Hinder.

(1)	(2)	(3)	(4)	(5)	(6)
Scheveningen, PCH, 1,800 sp.	1115 request	0700	S.	O.I.C.	SPECIAL REPORTS FOR MARINERS. "KNMI" (1-4) BBBDD FWTTu (5) BBBDD FWTT Followed by storm signal (when necessary) and notices to mariners (in Dutch and English) see Hydrographic Section NOTES: (1) denotes missing ob. (2) No index numbers are transmitted, the fixed order of stations as given below being adhered to (3) The storm signal gives notice of shifting of centre of storm (4) Messages are sent three times in succession Stations: Helder, Flushing, Griz Nez, The Hague, Yarmouth, Tynemouth, Skudesnae, Keitum
HONDURAS					
Swan Is., US, 2,240 sp. . .	0445	0100	W.F.	p.l.	Message <i>en clair</i> containing wind and weather forecasts for the western part of the Gulf of Mexico (west of longitude 90°), eastern part of the Gulf of Mexico (east of longitude 90°) and the Caribbean Sea (west of longitude 73°) and for the Windward Passage. Whenever the conditions warrant, the forecasts will be preceded by storm or hurricane warnings, and warnings regarding "northers" during the winter months. NOTE: When a hurricane is in progress the Weather Bureau will issue reports regarding its location, direction, progress and intensity at frequent intervals. As for 0445 message above.
HONG-KONG	1730	1300	W.F.	p.l.	<div> <div>Weather report and forecast based on observations from about 30 stations</div> <div>Storm warnings are broadcast at about 0400 and repeated every 2 hours until 1600 G.M.T. or until the next warning is issued</div> </div>
Cape d'Aguiar, VPS, 600 . .	0500 0900 1200 0400	2200 — 0600 —	S.E. S.F. S.F. W.	p.l. " " "	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
HUNGARY	(1)	(2)	(3)	(4)	(5)
sepel (near Budapest), HB, 4,400 c.w.	0835	0600	S.	O.I.C.	SYNOPTIC REPORTS. "Météo Hongrois" In In BBBDD FWTTTC bbbRR MMmm NOTE.—This report is issued by the Institute of Meteorology and Magnetism, Budapest, Stations: 01 Budapest, 02 Szombathely, 03 Kaposvar, 04 Szeged, 05 Debreczen
ICELAND					SYNOPTIC REPORTS.
Reykjavik, TFA, 1,800 sp.	1115 (see note col. 6)	0900 0700	S. S.	N.I.C. mod.	(1) (Ob. at 0900 at Reykjavik, Vestman- naeyjar, Isafjördr, Akreyri, Seydisfjördr and at 0700 at Thorshavn). TTDFw BBbw (2) (Ob. at 0900 at Grindavik, Stykkisholmr, Grimstadir, Raufarhöfn, Holar, Copenhagen, Utsire, Tynemouth, Lerwick and Jan Mayen.) TTDFw (3) Résumé of meteorological situation and forecasts for Iceland Similar to 1115 (1) and (2) message above, except that stations at Grimstadir, Copenhagen, Utsire, Tynemouth, Lerwick and Jan Mayen are omitted
	1915	1800	S.	N.I.C. mod.	

NOTES: (1) Reports broadcast *daily*, except that on Sundays and holidays transmission is at 1230 instead of 1115

(2) D = Direction of wind (scale 0-8; 9 = no ob.)

(3) F = Beaufort wind scale. When the wind exceeds 9 on this scale, it is signalled by 9 followed by the words "ROK" (whole gale), "Ofsavoredur" (storm), or "Farvidri" (hurricane)

(4) W and w = past and present weather respectively as follows:—

Code:

0 = Clear sky
1 = Cloudy
2 = Fog, mist

3 = Light rain
4 = Moderate rain
5 = Heavy rain

6 = Light snowfall
7 = Moderate snowfall
8 = Heavy snowfall

9 = Hail

(5) Missing observations are replaced by a hyphen and stations that are omitted by the word "Vantar" (missing)

(1)	(2)	(3)	(4)	(5)	(6)
IRISH FREE STATE					WESTERN SEABOARD REPORTS (SYNOPTIC) FOR MARINERS.
Valencia, GCK, 600 sp.	0918	0700	F.	p.l.	(1) "Western" <i>en clair</i> statement of the general meteorological situation and forecast for 24 hours for the Western Seaboard of the British Isles (2) (Stations in the order given in the list) BBDFVs BBDFVs BBDFVs BBDFVs BBDFVs K'K'K'K'K' As for 0915 message above
	2118	1800	F.S.	„	

NOTES: (1) The last group of figures in (2) gives bar. tendency (K') for the stations in their order.

(2) Missing ob. are replaced by a hyphen.

(3) Vs = Visibility from coast stations towards the sea in code IVa (same as V in N.I.C.).

(4) D is wind direction on scale 0-8, 0 = calm, 2 = E, 8 = N., etc. Other symbols in N.I.C.).

(5) Confusion sometimes arises between the words "Ireland" and "Iceland" when used in the Weather Bulletins, owing to their similarity in the Morse code. To obviate this, on and after June 1st, 1924, whenever the word "Iceland" is used it will be transmitted thus:

Iceland Iceland
in order to distinguish it from "Ireland" which will be transmitted:
Iceland

for describing the situation of a pressure area, etc.

(6) The information as to wind and barometer and what the barometer is doing at the five specially selected observation stations will enable the navigator to anticipate meteorological changes in western home waters, and together with W T reports from other ships at sea will greatly add to the value of his weather chart, especially the barometric tendency, from which he may obtain an approximation of how pressure systems are moving.

STATIONS (taken in order in messages): Stornoway, Blacksod Point, Holyhead, Scilly, Dungeness.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) IRISH FREE STATE — <i>contd.</i> Malin Head, GMH, 600 sp. . .	(2) 0930 2130	(3) 0700 1800	(4) F.S. F.S.	(5) " "	(6) Same form as 0918 and 2118 messa respectively from Valencia GCK above
ITALY S. Paolo (Rome), IDO ,10,850 c.w.	0850 1950	0700 1800	S. U.W. S. U.W.	O.I.C. mod. Special O.I.C. (mod.) Special	SYNOPTIC REPORTS. (1) InIn BBBDD F ₁ WTTW ¹ gbbk MMmmu (2) V ₁ D ₁ V ₂ D ₂ V ₃ D ₃ V ₄ D ₄ V ₅ D ₅ V ₆ D ₆ (1) InIn BBBDD F ₁ WTTu (2) V ₁ D ₁ V ₂ D ₂ V ₃ D ₃ V ₄ D ₄ V ₅ D ₅ V ₆ D ₆

NOTES: (1) "x" is used to denote missing information

(2) F₁ = Force of surface wind

(3) V = Speed of upper wind

Code No.	Beaufort Code No.	Speed in metres (V) per sec.
0	= 0 or 1	0 to 1
1	= 2	1 " 3
2	= 3	2 " 5
3	= 4	3 " 7
4	= 5	4 " 9
5	= 6	5 " 11
6	= 7	6 " 13
7	= 8	7 " 15
8	= 9	8 " 17
9	= 10, 11, or 12	9 = above 17

(4) D = direction of U.W. (where
1 = N, 2 = N.E. 8 = N.W., etc.)

(5) U.W. are reported at the six
heights 500m, 1,000m, 1,500m,
2,000m, 3,000m, 4,000m, above
mean sea level

Stations :	01 Turin	12 Maddalena
	02 Milan	13 Naples
	04 Padua	14 Brindisi
	05 Trieste	15 Cagliari
	06 Genoa	16 Messina
	07 Florence	17 Palermo
	08 Leghorn	18 Vittoria
	09 Ancona	19 Taranto
	10 Chieti	20 Venice
	11 Rome	21 Vigna di Valle

(1) JAMAICA Kingston, VQI, 600 sp. . .	(2) 0100 1300	(3) 2000 1200	(4) S. S.	(5) p.l. p.l.	(6) } <i>En clair</i> message Example of message : " Kingston forenoon barometer 29.85, wi north-east, 6 mi./hr., partly cloudy NOTE : Barometer readings are reduced M.S.L.
JAN MAYEN ISLAND Jan Mayen, JN, 600, 1,000, 1,600.	0710 1310 1810	{ 0100 0700 1300 1800	S. S. S.	— — —	{ SYNOPTIC MESSAGES The 1,000 metre wave is used for co municating with Fanske W/T station Storm warnings are transmitted wh necessary
JAPAN Choshi, JCS, 600 sp. . .	0300 0900 2100 0300 0900 2100	— — — — — —	— — — — — —	— — — — — —	{ SYNOPTIC REPORTS. Bar. pressure ; wind force and state of t weather ; wind direction (see Japanese M Code) do. do. do.
Funabashi, JJC, 4,000 or 6,800	0030 0530	2100 0300	S. "	Japan- ese met. "	(1) Barometric pressure (two symbols, Tab I) ; force of the wind and state of t weather (one symbol, Table II) ; wind directi (one symbol, Table III) from the unde mentioned stations taken in order Ishigaki jima Choshi Nemoro Nafa Hachijo jima Mokpho Naze Chichi jima Sonjin Miyazaki (Ogasawara) Ryojunki Shiwomisaki Fukui Changch Nagasaki Akita Tsingtao Shimonoseki Sappora Shanghai The reports from the observation stations a given in the above order ; thus, the first gro relates to Ishigaki jima, the second to Nafa, a so on. When observations are lacking, fo ciphers replace the missing group (2) The second part of the bulletin gives t state and movement of the "Highs" a "Lows." Full details of the symbols used a given in the Japanese Meteorological Code

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
APAN— <i>contd.</i>					
Kaiyo. Meteorological Obser- vatory (Kobe), JTJ, 750 sp. 2,650 c.w.	1230	—	—	—	See 0030 and 0530 messages above The messages are first transmitted on spark, and repeated five minutes later on continuous wave
Osesaki, JOS, 600 sp.	0300	—	—	—	} Bar. pressure, wind force and state of the weather; wind direction (see Japanese Met. Code)
	0900	—	—	—	
	2100	—	—	—	
Otchishi, JOC, 600 sp.	0300	—	—	—	} do. do. do.
	0900	—	—	—	
	2100	—	—	—	
Shiomisaki, JSM, 600 sp	0300	—	—	—	} do. do. do.
	0900	—	—	—	
	2100	—	—	—	
Shimotsui, JSX, 600 sp.	0300	—	—	—	} do. do. do.
	0900	—	—	—	
	2100	—	—	—	
Tsunosuna, JTS, 600 sp.	0300	—	—	—	} do. do. do.
	0900	—	—	—	
	2100	—	—	—	

JAPANESE STORM AND TYPHOON WARNINGS.

Storm and typhoon warnings are broadcasted by the Japanese W/T stations enumerated in the undermentioned schedule. The service includes stations in Kwang-Tung and Formosa (Taiwan). The messages are transmitted either *en clair* or in code. For the latter purpose two separate codes are used, known as "Code A" and "Code B." These are given in detail below.

CODE A.

The message is transmitted in the following form:—

Warning.	Date.	Time.	Position of centre of Depression or Typhoon.		Barometer. at centre.	Direction of movement.
			Long.	Lat.		
N	DD	TT	MMM	PP	BBBB	ZZ
WARNING (N) :			DATE (DD) :		TIME (TT) :	

1 = Depression.
2 = Typhoon.

01 = 1st day of month.
15 = 15th do.

00 to 23 representing Standard Time in hours.

POSITION (MMM PP) :

The position of the centre of the depression or typhoon will be given in degrees of Long. and Lat. Three figures are used for the former, and two for the latter, thus: 135 32 = Long. 135° E. Lat. 32° N.

BAROMETER (BBBB) :

The pressure at the centre will be given in inches, indicated by four figures, thus: 2822 — 28.22 inches.

MOVEMENT (ZZ) :

This will give the direction in which the centre of the depression or typhoon is moving, according to the under-mentioned table:—

Code.	Meaning.	Code.	Meaning.	Code.	Meaning.	Code.	Meaning.	Code.	Meaning.
00	Uncertain.	04	E.	08	S.	11	W.S.W.	14	N.W.
01	N.N.E.	05	E.S.E.	09	S.S.W.	12	W.	15	N.N.W.
02	N.E.	06	S.E.	10	S.W.	13	W.N.W.	16	N.
03	E.N.E.	07	S.S.E.						

CODE B.

The message is transmitted in the following form :

Area threatened.		Storm Warning.		Remarks.	
A		C		E	
Code.	Sea Area.—(A)	Code.	Warning.—(C)	Code.	Remarks.—(E)
1	Yellow Sea (Kokai)	1	Gale from N.E.	0	No remarks.
2	Eastern Sea (To Kai)	2	do. E.	1	Changeable.
3	Japan Sea	3	do. S.E.	2	Prospect of wind moderating to-morrow.
4	do. Northern portion	4	do. S.	3	do. continuing unaltered to-morrow.
5	Sea E. of Japan	5	do. S.W.		
6	Sea S. do.	6	do. W.	4	Gale, with prospect of fine weather follow.
7	Sea S.E. do.	7	do. N.W.		
8	Sea in vicinity of Formosa (Taiwan)	8	do. N.		
9	China Coast.—Northern part	9	Storm probable		
10	do. Southern part	0	Snow storm probable		

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
JAPAN—contd.					
Formosa (Keelung), 600 sp...	1230 request	—	W.	Code A	"QST QST QST" followed by message which is sent three times. Storm signals are also broadcast immediately upon receipt and at the commencement of each succeeding hour
Darienwan (Kwang-Tung), JDA, 600 sp.	1300 request	—	W.	Code A	do. do. do.
Chosi, JCS, 600 sp. ...	1205	—	W.	"	do. do. do.
Otchishi, JOC	—	—	W.	"	do. do. do.
Shiomisaki, JSM	—	—	W.	"	do. do. do.
Shimotsui, JSX	—	—	W.	"	do. do. do.
Tsuno Sima, JTS	—	—	W.	"	do. do. do.
Ose Saki, JOS	—	—	—	—	—
(All above 600 sp.)					
Kaiyo Met. Ob. (Kobe), JTJ, 600 sp.	0030 } 0630 } 1230 }	—	W.	p.l.	The storm warnings are broadcasted <i>en clair</i> in English
			W.	Code B	
KAMCHATKA					SYNOPTIC REPORTS.
Petropavlovsk, RCP, 2 000 ..	1512	—	S.	N.I.C.	(1) "Met. met..met. de RCP RCP-RCP QST name of station <i>en clair</i> " BBBDDF
			S.	p.l.	(2) <i>En clair</i> message (Russian) giving general atmospheric conditions and positions of the centres of typhoons and depressions with their probable direction when necessary (See under Russian Maritime Province Vladivostok, for stations)
			W.		NOTE: If it is found impossible to transmit the above message at 1512, it will be sent at 2312 G.M.T.
KURIL ISLANDS					SYNOPTIC REPORTS.
Horomushiro, JHJ, 600 sp. ...	0300	—	—	Japanese met.	} Station open approximately from May 15 to September 30th each year
	0900	—	—	"	
	2100	—	—	"	
KWANG-TUNG					
Dairen Wan, JDA, 600 sp. ...	0400	—	—	Japanese met.	
	1000	—	—	"	
	2200	—	—	"	
LATVIA					SYNOPTIC REPORTS.
Liepaja, KCB, 2.650 c.w. ...	0810	0700	S.	N.I.C. (mod.)	"Météo Latvia" (1) InIn BBBDD FwwTT cbWVH ALAN RRmmr
			U.W.	N.I.C.	(2) "Pilot" Riga YYGG hddvv hddvv etc.
			U.A.T.	N.I.C.	(3) "Temp" Riga YYGG BBTTH BBTTH etc.
	1025		I	German	SPECIAL REPORT FOR NAVIGATORS (1) <i>Ice Report</i> of the same morning in same code as in German messages (see Hydrographic Section)
			W.	Special	(2) <i>Storm Warnings</i> —Warnings are sent in a special code given below for the following six districts in order in the form—ggggg 1. Skagerrak 2. Kattagat 3. South Baltic 4. North Baltic 5. Gulf of Bothnia. 6. Gulfs of Riga and Finland Code 1. <i>Gale Warnings</i> (g). o. No warning issued. 1. Gale (force 7-10) from between N. and W. 2. " " " " S. and W. 3. " " " " N. and E. 4. " " " " S. and E. 5. " " " " without given direction 6. Storm (force 11-12) from between N. and W. 7. " " " " S. and W. 8. " " " " N. and E. 9. " " " " S. and E. X No information

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
ATVIA—contd.		0700	S.	N.I.C. Special	(3) <i>State of the Sea and Swell</i> —(S) at 0700 at the same 13 stations as for Ice Report (above) (4) <i>General Weather Situation</i> in special code:— “LL” B ₁ LLID ₁ “LL” B ₁ LLID ₁ etc. “HH” B ₂ LLID ₂ “HH” B ₂ LLID ₂ etc.

Where “LL” indicates “low.”

B₁ “ degree of development of the
“low” in Code 1.
LL “ latitude in whole degrees.
ll “ longitude in whole degrees.
D₁ “ direction of movement of the
“low” in Code 3.

and similarly—

“HH” indicates “high.”

B₂ “ degree of development of the
“high” in Code 2.
LL “ latitude in whole degrees.
ll “ longitude in whole degrees.
D₂ “ direction of movement of the
“high” in Code 4.

Code 1. Intensity of Depression (B₁).

1. 755-760 mm.	6. 730-735 mm.
2. 750-755 “	7. 725-730 “
3. 745-750 “	8. 720-725 “
4. 740-745 “	9. 715-720 “
5. 735-740 “	0. 710-715 “

Code 2 Intensity of Anticyclone (B₂)

1. 760-763 mm.	6. 778-782 mm.
2. 763-766 “	7. 782-786 “
3. 766-770 “	8. 786-790 “
4. 770-774 “	9. 790-796 “
5. 774-778 “	0. above 796 mm.

Code 3. Direction of Movement of Depression (D₁).

1. to N.	6. to E.S.E.
2. “ N.N.E.	7. “ S.E.
3. “ N.E.	8. “ S.S.E.
4. “ E.N.E.	9. “ S.
5. “ E.	

Movement to west is given *en clair*

Code 4. Direction of Movement of Anticyclone (D₂).

1. to N.	5. to S.
2. “ N.E.	6. “ S.W.
3. “ E.	7. “ W.
4. “ S.E.	8. “ N.W.

(1)	(2)	(3)	(4)	(5)	(6)
				p.l.	(5) Navigational warnings in plain English (See Hydrographic Section)
	1410	1300	S.	N.I.C. (mod.)	SYNOPTIC REPORTS. “Météo Latvia” (1) InIn BBBDD FwwTT cbWVH ALaNh
			U.W.	N.I.C.	(2) As for 0810 message above
			U.A.T.	N.I.C.	(3) Do. do.
	1910	1800	S.	N.I.C. (mod.)	“Météo Latvia” (1) InIn BBBDD FwwTT cbWVH ALaNh
			U.A.T.	N.I.C.	RRMMr (2) As for 0810 message above

NOTES.—(1) mm and MM have the same meaning for coastal stations as for inland stations.

(2) In Upper Air Reports, YY = day of month; GG = hour of ob. in G.M.T.

(3) Stations 05 and 06 observe at 0700, 1300 and 2100 *local time*, and the messages from these stations are transmitted only at 0810.

STATIONS.—01 Riga (L), 02 Liepaja (C), 03 Mahava (L), 04 Dangavpils (L), 05 Ventspils (C), 06 Priekuli (L)

(1)	(2)	(3)	(4)	(5)	(6)
Riga, KCA, 1,400 sp. ..	1350	1400 (sec notes)	S.	German	SYNOPTIC REPORTS. (Ob. at 1400 G.M.T. <i>previous day</i> at Riga) BBBDD FwTTW ₂ cbbPA ₂ If necessary this message is followed by upper air observations: Pilot ZZwVc ₁ HHD ₁ D ₁ F ₁ HHD ₁ D ₁ F ₁ a ₃ d ₂ d ₂ f ₂ Ascent YYZZV HH BBBD ₁ D ₁ F ₁ TTP ₃ P ₂ HH BBBD ₁ D ₁ F ₁ TTP ₃ P ₃ . . . c ₁ a ₃ d ₂ d ₂ f ₂ General review of the weather situation <i>En clair</i> in English Reports concerning the weather and state of the sea are also sent on request <i>en clair</i> messages (English) for the Eastern Baltic and the Gulf of Riga
Riga, KCA, 600 sp. ..	1005	—	W.	p.l.	SYNOPTIC REPORTS. BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aNh R ₁ R ₁ SVZ ₂ BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aNh BBBDD Fw ₁ w ₁ TT c ₁ b ₃ W ₃ VP AN ₁ aNh R ₁ R ₁ SVZ ₂
LITHUANIA Memel, RYM, 800 sp. ..	0700	—	S.	German Met.	
	1300	—	S.	“	
	1800	—	S.	“	

Country, Station, Call, Wave length.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature /of Report.	Dode	Form of Message and Notes
(1)	(2)	(3)	(4)	(5)	(6)
MADAGASCAR					
Zaudzi (Mayotta Is.), HYH	See	—	W.	—	This telegram will be preceded and followed by the warning signal ——— • • ——— repeated at short intervals. If the warning signal only is sent out it will indicate in the absence of precise information, that there is reason to expect the passage of a cyclone
Majunga, HYE	notes				
Diégo Suarez, HYD ..					
Tamatave*, HYL					
(All 600 sp.)					

During the whole of this service the Zaudzi, Majunga, Tamatave and Diégo Suarez stations will remain on the watch, outside the regular hours of working, during the first quarter of each hour, except between 2115 and 0300.

NOTES:

The warning telegram, originating at the Observatory at Tananarive, will be sent out at the even hours (except between 2100 and

0300), during the probable continuance of the cyclone in the zone within range of the stations, alternately by Zaudzi and Majunga stations in the case of a cyclone affecting the region to the north-west of Madagascar or the Mozambique channel, and alternately by the Zaudzi, Tamatave and Diégo Suarez stations in the case of a cyclone affecting the regions to the north-east and east of Madagascar.

* This station will be replaced by another (15 kw.) towards the middle of 1925.

(1)	(2)	(3)	(4)	(5)	(6)
MALTA					SYNOPTIC REPORTS.
Cala Frana, GHA, 4,800 c.w.	0735	0700	S.	N.I.C.	(1) BBBDD FwwTT cbWVH ALAN
			U.W.	"	RRSV _{sr} MMmm
	1335	1300	S.	"	(2) "Pilot" h ₁ ddvv h ₁ ddvv, etc.
			U.W.	"	(1) BBBDD FwwTT cbWVH ALANh
	1835	1800	S.	"	(2) "Pilot" h ₁ ddvv h ₁ ddvv, etc.
			U.W.	"	(1) BBBDD FwTT cbWVH ALANh
					RRSV _{sr}
					(2) "Pilot" h ₁ ddvv h ₁ ddvv, etc.
					Stations: Surface ob. at The University of Valetta; U.W. at Pieta
MEXICO					
Campeche, XAB, 600 sp. ..	1837	—	—	—	—
Chapultepec, XDA, 4,500, 2,000 sp.	0100*	—	—	German met. (mod.)	BBBD ₃ F w ¹ b ¹ NA ¹ d ¹
					NOTES: For BBBD ₃ FN see German Meteorologic Code

d¹ = Direction of the clouds (see D³).

w¹ = State of the weather at the time of observation:

1 Fine 2 Cloudy 3 Overcast 4 Rain

b¹ = Barometric tendency during previous 2 hours:—

0 Steady (less than 1 mm.) 3 Rising 1.5 mm.

1 Rising 1 mm.

2 Falling

4 Falling

5 Rising 2 mm.

A¹ = Clouds and movement:—

0 Clear

1 High clouds (Ci, Ci—Str,

Ci—Cu, A—Cu, A—Str)

2 Slow moving Str—Cu

3 Quick moving Str—Cu

4 Slow Cu

5 Snow 6 Storm 7 Hail 8 Thick fog

6 Falling 2 mm.

7 Rising 2.5 mm.

8 Falling 2.5 mm.

9 Over 3 mm.

5 Quick moving Str—Cu

6 Slow Str

7 Quick Str

8 Slow Nb or Cu—Nb

9 Quick Nb or Cu—Nb

(1)	(2)	(3)	(4)	(5)	(6)
	1900*	—	—	"	As for 0100 message above
					STATIONS:
					Acapulco Leon Progreso
					Chihuahua Manzanillo Salina Cruz
					Frontera Matamoros Tacubaya
					Guaymas Mazatlan Tampico
					Islas Marias Monterrey Tapachula
					La Paz Payo Obispo Vera Cruz
Mazatlan de Sinoloa XAE, 900 sp.	0000	1600	S.	German met. p.l.	(1) Surface ob.
			F.	—	(2) Forecast for the Pacific Coast and the Gulf of California
	1600	2100	S.	—	As per 0000 G.M.T. message above
			F.	—	
					STATIONS:
					La Paz Islas Marias Salina Cruz
					Guaymas Manzanillo
					Mazatlan Acapulco
Payo Obispo, XAC, 600 sp...	1837	—	—	—	—
Vera Cruz, XAA, 600 sp. ..	1837	—	—	—	—

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
MOROCCO					SYNOPTIC REPORTS.
Médiouna, CNM, 1,500 sp. ..	0945	—	S.	p.l.	Moroccan Synoptic in p.l.
Médiouna, CNM, 3,600 c.w.	0200	0100	S.	N.I.C.	"Météo Afrique" InIn Nh BBBTT ₁ cb ₁ b ₁ wf DDFN ₁ V
	0800	0700	S.	"	"Météo Rabat" (ob. from Morocco) Full French code as for 0220 message above. (Sec
	1400	1300	S.	"	under France—Eiffel Tower). "Météo Afrique"
	1900	1800	S.	"	as for 0220 message above "Météo Afrique" as for 0220 message above
STATIONS :					
1 TANGIER	12 Ujda	34 BISKRA	44 El-Oued	68 Metlaoui	
3 RABAT	13 Marrakesh	35 Touggourt	45 Ghardaïa	69 Qabes	
4 Casablanca	14 Asaka	36 Ouargla	46 Adrar	80 Funchal	
5 Safi	15 BU DENIB	37 In-Salah	61 TUNIS	81 Angra	
8 Ouezzan	16 Guercif	38 Colomb-Béchar	62 BIZERTA	82 Port Etienne	
6 Mogador	17 Kasbah Tadla	39 Béni-Abbès	63 Sfax	83 Dakar	
7 AGADIR	18 Timadit	40 Timimoun	64 Medinine		
9 Meknes	31 ORAN	41 Laghwat	65 Tozeur		
0 FEZ	32 ALGIERS	42 Ain-Sefra	66 Ben Gardane		
1 Taza	33 SETIF	43 El-Goléa	67 Susa		
(1)	(2)	(3)	(4)	(5)	(6)
Médiouna, CNM, 1,500 sp. ..	1615	—	S.F.	p.l.	Moroccan synoptic report <i>en clair</i> followed by forecast
Casablanca, CNP, 1,500 sp.	0945	0700	S.	p.l.	<i>En clair</i> message giving surface ob. taken at Moroccan ports.
	1615	—	F.	"	Forecast for following day.
Casablanca, CNP, 600 sp. ..	see notes	—	F.W.	p.l.	On exceptional occasions (when a gale is anticipated) forecasts and storm warnings are issued as required.
NEW GUINEA					
Port Moresby, VIG. Samarai, VIJ. (Both 600 sp.)	request	—	F.	—	Forecasts transmitted when requested by ship or when necessary
NEW ZEALAND					
Awanui, VLA 600 sp. ...	1000	—	F.W.	—	See under Apia, Pacific Islands, for details Storm warnings issued by Apia (Pacific Islands) are sent immediately after weather report These reports are not sent Sat. or Sun. unless the conditions are exceptional
Wellington, VLW, 600 sp...	0930	—	F.	—	
Awarua, VLB	0900	—	—	—	
Chatham Islands, VLC	—	—	—	—	
Auckland, VLD, 600 sp. ...	—	—	—	—	
NORWAY					SYNOPTIC REPORTS.
Christiania, LCH, 5,450 c.w.	0750	0100	S.	N.I.C.	"Météo Norvégien"
		0700	S.	N.I.C.	(32, 47) InIn BBBDD FwwTT cbWVH ALaNH RRSV _{sr}
		0700	S.	N.I.C.	(01) InIn't' BBBDD FwwTT cbWVH ALaNH RRrsFm
		0700	S.	N.I.C.	(90) InIn BBBDD FwwTT cbWVH ALaNH RRmmr C ₁ ddVV
		0700	S.	N.I.C.	(32) InIn BBBDD FwwTT cbWVH ALaNH RRSV _{sr} C ₁ ddVV
		0700	U.W.	N.I.C.	(Other stations) InIn BBBDD FwwTT cbWVH ALaNH RRSV _{sr}
		0700	U.A.T.	N.I.C.	"Pilot" (97, 98, 99) InIn h ₁ ddvv h ₁ ddvv etc.
		0700	O.	N.I.C.	"Temp" (91, 93) InIn YYGG BBTH etc. PQLL MGG BBDDF wwVKd ALaNFm dsdsrW TTHc bttt
	1050	1000	S.	N.I.C.	(47) InIn BBBDD FwwTT cbWVH ALaNH
	1350	1300	S.	N.I.C.	(32, 90) InIn BBBDD FwwTT cbWVH ALaNH C ₁ ddVV
		1300	S.	N.I.C.	(Other stations) InIn BBBDD FwwTT cbWVH ALaNH
		1300	U.W.	N.I.C.	As for 0750 message above
		1300	O.	N.I.C.	As for 0750 message above
	1650	1600	S.	N.I.C.	(47) InIn BBBDD FwwTT cbWVH ALaNH
	1850	1800	S.	N.I.C.	(90) InIn BBBDD FwwTT cbWVH ALaNH RR--r C ₁ ddVV
		1800	S.	N.I.C.	(32 and other stations) as for 0750 message above
		1800	U.W.	N.I.C.	As for 0750 message above
		1800	O.	N.I.C.	As for 0750 message above

NORWAY—contd.

NOTES: (1) Stations, 05, 30, 59, 70, 82, are not transmitted regularly but only when normal stations are missing.

(2) 01 Maud is only transmitted during the Polar night. The geographical position of the "Maud" is given from time to time. Reports from Danish, Swedish and Norwegian ships are included in these messages.

(3) Special Codes:

Fm = max. wind force since time of previous ob. Code fig. 0 = Beaufort No. 10, 1 = 11, 2 = 12, 3 = 0 to 3, 4 = 4, etc.

dds = Ship's course on scale 01-32 (08 = E, etc.)

s = time of cessation of precipitation on same scale as for commencement in N.I.C. where 0 = no rain or rain still falling.

bb = amount of bar. tendency in half mbs. during preceding 3 hrs. with addition of 50 to indicate negative tendency

Stations: 01, ss. "Maud" (Amundsen's Polar Expedition), 02 Quade Hook (C), Spitzbergen; 05 Green Harbour (C), Spitzbergen; 10 Ingöy (C), 12 Tromsö; 22 Vällersund (C); 27 Kinn (C); 30 Oksöy (C); 32 Lister (C), 35 Björnöya (C), 40 Andenes (C), 42 Röst (C), 47 Jan Mayen (C), 55 Ferder (C), 57 Ona (C), 59 Runde (C), 60 Vardö (C), 70 Brønnöy (C), 80 Utsire (C), 82 Skudesnes (C), 90 Dombaas (L)

Pilot Balloon Stations: 97 Bergen, 98 Tromsö, 99 Aas

Upper-air temperature and humidity: 91 Kjeller, 93 Horten.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) Jan Mayen, JN, 1,000 sp. . .	(2) 0710 1310 1810	(3) 0100 0700 1300 1800	(4) S.U.W. " W.	(5) — — p.l.	(6) SYNOPTIC REPORTS. Storm warnings issued as necessary. "POLAR FRONT" REPORTS "Météo"
Bergen, LGN, 1,850 c.w. (re- peated on 600 sp. and R/T.)	0950 2050	0700 1800	S. S. W.	— — —	

(1) "Situation" BBK¹¹D¹D¹ F¹LL¹¹ gives the more important depressions over North-west Europe and the North Atlantic.

BB = barometric pressure, in whole millibars in the centre of the depression or anti-cyclone. (Initial figures, 9 or 10, omitted)

K¹¹ = probable variation of barometric pressure (see Table I)

D¹D¹ = direction from which centre is moving (scale 00-32). When a depression is referred to 50 is added to the number. 49 and 99 = direction unknown.

F¹ = speed of movement of centre (the scale taken being a degree of lat. at the Equator per 12 hours; 9 indicating any speed over 8 degrees)

LL = Lat. (N.) of the centre

11 = Long. (for Long. E. of Greenwich 50. is added to the number)

The word "central" indicates that the two succeeding groups describe an extensive stationary depression, which will determine the wind currents in its vicinity for several days

(2) "Fronter" NNnf

gives information relating to the "Polar Front" and "Series of Cyclones"

NN = index number of "series" (counting from the beginning of the year)

n = index number, in the "series," of the member described in the succeeding groups, scale 1-9, generally followed by a break through of "polar air" and the formation of an anti-cyclone. X = number not yet determined f = the "front"

Following this group are two or more groups of the form F¹LL¹¹, which relate to points on the "front." If several are given the information is separated by the "break sign" (— • • • —)

(3) "Veirvarsler," followed by forecasts *en clair* (Norwegian) five sections of the

west coast of Norway from Lindesnes (The Naze) to Rörvik (near Brønnöy)

(4) "Stormvarsler," followed by storm warnings *en clair* (Norwegian), when the wind exceeds Beaufort force 7, for the same areas as Part III. When the force is unlikely to exceed 6, or is likely to decrease without change of direction, the words "Stormvarsler Ingen" are transmitted

SPECIAL CODES. Table I.—(K¹¹)

Probable variation of pressure in the centre of a depression or an anti-cyclone during the ensuing 12 hours.

Code

0	pressure will remain almost constant.	
1	will rise slowly	Depression filling-up or
2	rise	
3	will rise rapidly	Anti-cyclone increasing in intensity
4	Do. very rapidly	
5	will fall slowly	Depression growing deeper or
6	fall	
7	will fall rapidly	Anti-cyclone decreasing in intensity.
8	Do. very rapidly	
9	Do. abnormally	
x	no determination possible	

Table II.—(f)

Character of the most noteworthy "front" in the system NNn

Code

1	not very well marked	"cold front"
2	well marked	
3	very pronounced	
4	violent	
5	not very well marked	"warm front"
6	well marked	
7	very pronounced	
8	not very well marked	"occlusion"
9	well marked	
0	very pronounced	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
NORWAY—contd.					
SYNOPTIC REPORTS.					
Bergen, LGN, 600 sp. ..	0755 1530 1855	0700 1500 1800	S. S. S.	N.I.C. " "	" Kystmet " (Météo Côtière) InIn VLVsS- DDFww NOTE.—VL = visibility towards the coast STATIONS :— Titran 49, Kvitingsøy 50, Viksøy (Mar- stenen) 51, Hustad 54, Runde 59, Bulandet 64, Byrknesøy or Hellisøe 69, 74, Lindesnes 89, Ferder 55
Tjøme, LET, 600 sp. ..	0730 1830	0700 1800	S. S.	" "	
SYNOPTIC REPORTS.					
Fauske, LDW, 1,800 sp. ..	0715 1315 1815	0700 1300 1800	S. S. S.	N.I.C. " "	BBBDD FwwTT cbWVH ALaNH RRSVsr BBBDD FwwTT cbWVH ALaNH RRMMr BBBDD FwwTT cbWVH ALaNH RRmmr Stations :—Jan Mayen, Röst
Green Harbour (Spitzbergen) LFG, 1,000 sp.					
Bear Island, LWP, 1,200 sp.					
Tromsø, 1,400 c.w. ..	1030 1515 2015	0700 1300 1800	W., F. " "	p.l. " "	Storm warnings and forecasts for northern Norway <i>en clair</i> (Norwegian)
PACIFIC ISLANDS					
Tonga Islands					
Nukualofa VSB, 600 sp. ..	request	—	F.	p.l.	Local forecast <i>en clair</i> . NOTE : The station also transmits a weather report, together with that of Vavau, to Apia, at 2130 (9415 and 2130 during hurricane season containing barometric pressure cor- rected, dry and wet bulb thermometers, wind direction and force (Beaufort), and amount of sky clouded (scale 0-10), as follows :— 2990 78 76 SE 5 10
Cook Islands					
Rarotonga VMR, 600 sp. ..	—	—	—	—	—
Samoa Islands					
Tutuila NPU, 2,255 sp. ..	0330 0730 2330	— — —	— — —	— — —	Local weather reports preceded by the letter "T"
Apia, VMG, 2,000 sp. ..	0830 2330	— —	— —	— —	See notes below

PACIFIC ISLANDS—contd.

SOUTH PACIFIC OCEAN: WEATHER REPORTS

1. An exchange of weather conditions between various islands in the South Pacific now takes place, Apia being the central station for the collection of reports. The observations are made at 0330 G.M.T.(civil) for the p.m.message throughout the year: and at 2030 G.M.T. during the hurricane season for the a.m. message. The following is the procedure for the interchange of reports:—

2. The actual message will consist of:—

(a) Station from which report emanates, i.e. Apia, Suva, Nukualofa, Norfolk Island, Fila, Awanui, Numea and Vavau when fitted with W/T.

(b) Barometer (corrected for temperature and height) in inches.

(c) & (d) Thermometer, dry and wet bulb as read respectively, e.g., 80 79

(e) & (f) Wind, direction (true) and force (Beaufort), as read, e.g., E.N.E. 3

(g) State of sky and weather in Beaufort notation

(h) G.M.T. at which observations were made, if not in accordance with para. 1.

The station broadcasting weather reports makes each report successively; break sign (— • • • —) separates each report

Example—

Apia 30 16 80 79 E.N.E. 3 BC (Break sign)
Suva 30 08 79 78 E.N.E. 5 OCR (Break sign)
Nukualofa Fila Numea
Norfolk Island Awanui Vavau, etc.

3. Owing to the inability of some of these islands to intercommunicate direct and having to relay through, the following routine is to be observed.

(a) During the Hurricane Season

(i) Fila exchanges weather reports with Numea in time to enable the former to transmit both reports to Suva at a prearranged hour

Nukualofa sends its weather report, together with that of Vavau, to Apia at 2130 and 0830 G.M.T.

Suva passes to Apia at 2200 and 0815 G.M.T. the weather reports from Suva, Norfolk Island, Fila and Numea. The times for Norfolk Island and Fila being arranged by Suva.

Awanui passes to Apia the New Zealand barometer, wind and weather, at a time mutually arranged, in the same words as broadcast nightly

Rarotonga is not included in the scheme, but listens for Papeete; if there are indications of an atmospheric disturbance at Rarotonga, that station transmits a message, as indicated in para. (2), to Apia

Papeete transmits weather report to Apia at 0430 G.M.T., throughout the year, using the numerical code.

(ii) These reports are collected by Apia, and, together with Apia's own weather report, will be broadcast by Apia at the times laid down in para. 3 (iii) for all ships and stations. If there are signs of an atmospheric disturbance Apia will make the call sign for "all ships" (QST) and distribute the necessary information in addition, e.g.:—

Hurricane centre 200 miles N.W. of Suva at noon, 27th February, Apia time and date, travelling south.

(iii) When issued the data and warnings (if any) will be made at 2330 and 0830 G.M.T., followed by the time (either 0330 or 2030 G.M.T.) that the observations were taken: Apia broadcasting first on 2,000 metres, Suva repeating on 600 metres. If Apia issues a warning, Awanui broadcasts it immediately after the routine New Zealand weather report, and informs the Meteorological Office, Wellington.

(b) At times other than the Hurricane Season

(iv) The same procedure is followed as in para. 3 (i), omitting the a.m. observations and times, Apia and Suva broadcast the information as laid down in para. 3 (iii) at 0830 G.M.T. only

NOTE.—The hurricane season in connection with these arrangements is to be considered as from 1st November to 30th April inclusive

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) Papeete (Tahiti) FOP 600 sp.	(2) 1100 2300	(3) —	(4) S. W.	(5) O.I.C. p.l.	(6) "Tahiti observatoire" BBBDD FWu "Tahiti TTT" followed by advice cyclones, typhoons, etc. NOTES: (1) Reports refer to ob. made at Point Venus. (2) Weather reports are transmitted three times in succession, the first time rapidly, the second and third times slowly (3) Storm warnings repeated three times with intervals of ten minutes (4) Missing figures are replaced by "x"
PANAMA					
Colon, NAX, 1,621 sp.	1000* 1800*	—	—	—	
Balboa, NBA, 2,400, 7,000 arc	1000 1800	—	—	—	
PHILIPPINE ISLANDS					
Cavite, NPO, 2,700 sp., 5,200 c.w.	0255* 1355*	2200 0600	F.W. F.W.	p.l. p.l.	Typhoon warnings and weather forecasts are broadcast immediately after the T.S.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
POLAND					SYNOPTIC REPORTS.
Varsaw, WAR, 2,400 sp. ..	0215	0100	S.	N.I.C.	"Météo Pologne"
	0815	0700	S.	N.I.C.	In In BBBDD FwwTT cbWVH ALaNh
			U.W.	special	(1) In In BBBDD FwwTT cbWVH ALaNh RRmmr
	1415	1300	S.	N.I.C.	(2) "Pilot" In In d'd'v'v'd' d'v'v'd'd'— v'v'd'd'v' v'd'd'v'v' d'd'v'v'
	1915	1800	U.W.	special	(1) as for (1) 0215 message above
			S.	N.I.C.	(1) In In " (2) In In BBBDD FwwTT cbWVH ALaNh RRMMr
					NOTES: (1) For the Aerial Line, Paris-Stras- bourg-Prague-Warsaw-Bucharest, aerial route reports and forecasts are added to the above messages.
					(2) Upper winds are reported at the following six heights in order: 500 m., 1,000 m., 1,500 m., 2,000 m., 3,000 m., 4,000 m. d'd' = direction of U.W. on scale 01-32 as for surface wind v'v' = speed of U.W. in metres/sec.

Stations:—

01 Posen (L)	09 Kielce (L)	17 Konitz (L)	24 Luck (L)
02 Warsaw (L)	10 Bromberg (L)	18 Graudenz (L)	25 Brest-Litovsk (L)
03 Vilna (L)	11 Zakopane (L)	19 Thorn (L)	26 Bjelovjeoch (L)
04 Lodz (L)	12 Pinsk (L)	20 Teschen (L)	27 Suvalki (L)
05 Lublin (L)	13 Neufahrwasser (C)	21 Przemyśl (L)	28 Baranovitschi (L)
06 Cracow (L)	14 Oxhöft (C)	22 Sniatyn (L)	29 Tourmont (L)
07 Tarnow (L)	15 Hela (C)	23 Rovno (L)	30 Bialystok
08 Lemberg (L)	16 Rixhöft (C)		

(1)	(2)	(3)	(4)	(5)	(6)
PORTO RICO					SYNOPTIC REPORTS.
San Juan, NAU, 4,836 c.w. at 0045, 2,855 sp. at 0200	0045	0000 (See notes)	S. F.	Americ'n p.l.	In In BBBDF Wind and weather forecasts for Gulf Coast, Caribbean Sea and Windward Passage for 24 hours. (En clair messages)
	0200	0100 (See notes)	W. S. F.	p.l. Americ'n p.l.	All hurricane warnings In In BBBDF Wind and weather forecasts for Gulf Coast, Caribbean Sea and Windward Passage for 24 hours.
	1500		W. F. W.	p.l. p.l. p.l.	Hurricane warnings and advisory messages relating thereto are broadcast whenever issued, and repeated every four hours at 0000 0400, 1200, 1600 and 2000 G.M.T. As above (0200 message) As above (0200 message)

NOTES.—(1) In the absence of a tropical storm the words "weather normal" will be sent each day.

(2) Messages sent daily from July 1st to November 15th.

(3) Obs. are made one hour earlier at stations in the Gulf of Mexico and Caribbean Sea.

STATIONS:

San Juan, P. R. .. SJ	Bridgetown, Barbados .. BB	Willemstadt, Curaçao .. W
St. Thomas, Virgin Islands ST	Santo Domingo, S. D. .. SD	Port of Spain, Trinidad .. PS
Basseterre, St. Kitts .. BT	Puerto Plata, S. D. .. SL	St. Martin's, D.W.I. .. SM
Roseau, Dominica .. RS	Castries, St. Lucia .. LU	

(1)	(2)	(3)	(4)	(5)	(6)
San Juan, WKAQ, 360 R/T	0100	—	W.	p.l.	Hurricane warnings for the benefit of shipping equipped with wireless telephone
	1400	—	W.	p.l.	As above. Only broadcast when a storm or hurricane is in progress over the eastern half of the Caribbean Sea from the Windward Islands westwards to San Domingo.
	1800	—	W.	p.l.	NOTE: These messages are sent in English and Spanish

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
PORTUGAL (1)	(2)	(3)	(4)	(5)	(6) SYNOPTIC REPORTS.
Monsanto, CTV, 3,000 c.w. . .	0835	0700	S.	N.I.C.	(1) "Météo Portugal" (name of ob. station <i>en clair</i>). BBBDD FwwTT cbWVH ALaNH RRmmr "mar" pddkθ.
			O.	"	(2) "Navires" PQLLL III GG BBDDF wwvKd
	1935	1800	S.	N.I.C.	(1) "Météo Portugal" (name of ob. station <i>en clair</i>) BBBDD FwwTT cbWVH ALaNH RRMMr "mar" pddkθ.
			O.	"	(2) As for 0835; (2) message above

NOTES:—

(1). The final group is a special code preceded by the word "mar" giving the state of the swell, the symbols having the following meanings:—

p = period of swell in seconds. O = 10 seconds or more.

dd = direction from which swell comes. (Scale 01-32, as for surface wind.)

k = height of swell on a progressive scale (0-9).

θ = tendency of swell at time of observations.

o No change. 2 Decreasing. 7 Increasing slowly. 9 Increasing rapidly.
1 Decreasing slowly. 3 Decreasing rapidly. 8 Increasing.

(2) In Ship's reports, the bar. reading is in mm. and tenths corrected, the initial 7 being omitted. Temp. is in whole degrees C.

STATIONS: Lisbon, Oporto, Coimbra, Funchal, Angra.

(1)	(2)	(3)	(4)	(5)	(6)
Monsanto, CTV, 1,000 sp. 2,400 c.w.	1245 2300	0700 1800	F. F.	p.l. p.l.	Weather forecast <i>en clair</i> in Portuguese and then repeated in English. Two transmissions are made of each message, first on 1,000 metres, followed 10 minutes later by the second on 2,400 metres
					These messages will contain observations giving—
					(1) General barometric situation; and
					(2) State of the weather on the coast of Portugal, Azores, Madeira, Strait of Gibraltar and Bay of Biscay: with
					(3) A forecast for the ensuing 24 hours.
					AZORES SYNOPTIC REPORT.
	2340	1800	S.	N.I.C.	(Name of station <i>en clair</i> BBDDx FwwHx cbWVx CNMMx RRSx KdGGx YYYYYZ
					NOTES: (1) x, Y and Z, are check figures
					(2) The message is first sent on 1,000 m. and repeated 10 mins. later on 2,400 m.
					STATIONS: Angra, Horta, Ponta Delgada
PORTUGUESE EAST AFRICA					
Lourenço Marques, CRZ.	0800	0630	S.	N.I.C. (mod.)	InInIn BBBSBr DDFww VsNRRR
					Stations: VNO East London, VND Durlan CRZ Lourenço Marques, CRT Beira
					NOTE: For code details see under South Africa
Mozambique, CRV, 600 sp. . .	0900	0700	S.	N.I.C. (mod.)	InInIn BBBSBr DDFww VsNRRR
					Stations: CRV Mozambique (Mossuril), CRT Beira, CRZ Lourenço Marques
					NOTE: For code details see under South Africa

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
ROUMANIA (1)	(2)	(3)	(4)	(5)	(6) SYNOPTIC REPORTS.
Bucharest, BUC, 8,300 c.w. (11,300 c.w. for 1350 message)	0150	0100	S.	N.I.C.	"Météo Bucuresti" (or only) BBBDD FwwTT cbWVH ALaNh
	0750	0700	S.	N.I.C.	(or) BBBDD FwwTT cbWVH ALaNh RRmmr
		0600 0500 0600	S. U.W.	N.I.C. N.I.C.	(02-15) InIn BBBDD FwwTT cbRRr (or only) h ₁ ddvv h ₁ ddvv, etc.
	1350	1300	S.U.W.	N.I.C.	As for 0750 message above. (U.W. ob. made between 0600 and 0800)
		0600	S.	N.I.C.	Ob. from stations (02-15) which are not in the transmission of 0750, preceded by the word "Retardé"
	1850	1800	S.	N.I.C.	(or only) BBBDD FwwTT cbWVH ALaNh RRMMr
					Stations: 01 Bucharest 09 Tecuci 02 Craiova 10 Ramnicusarat 03 Bolgrad 11 Sibiu 04 Chisinau 12 Turnu Severin 05 Cernauti 13 Tinusoara 06 Piatra Neamt 14 Carausebes 07 Sulina 15 Fasi 08 Constanta
Bucharest-Herestrau, BUC, 8,300 c.w.	0750	0700	S.	N.I.C. (See notes)	SYNOPTIC REPORTS. "Météo Bucurest" (or only) (1) InIn BBBDD FwwTT cbWVH ALaNh RRmmr
		0600	S.	"	(2) (Stations 02-15) InIn BBBDD FwwTT cbRRr
	1030		U.A. S.	"	(3) "Pilot" h ₁ ddvv h ₁ ddvv, etc. Repeat of 0750 message (1) (2) and (3) above
	1850	1800	U.A. S.	"	"Météo Bucurest" (or only) InIn BBBDD FwwTT cbWVH ALaNh RRMMr
Bucharest-Herestrau, BUC, 11,300 c.w.	1350	1300	S.	N.I.C. (See notes)	(or only) "Météo Bucurest" InIn BBBDD FwwTT cbWVH ALaNh NOTES: b = Barometric tendency in half mm. to nearest whole number, neglecting fractions. Thus if a tendency is 1.3 mm., this is sent as 3 in the message. (2 × 1.3 = 2.6 = 3 to nearest).
STATIONS: 01 Bucharest 04 Chisinau 07 Sulina 10 Ramnicu-Sarat 13 Timisonra					
02 Craiova 05 Cernauti 08 Constanta 11 Sibiu 14 Caransebes					
03 Belgrade 06 P. Neamt 09 Tecuci 12 Turnu-Severin 15 Lasi					
RUSSIA (1)	(2)	(3)	(4)	(5)	(6) SYNOPTIC REPORTS.
Petrograd (Leningrad), RET, 7,100 c.w.	0915	(See notes)	S.	O.I.C. mod.)	(Russian and Siberian ob. of 2100 previous day and 0700 same day local time) (1) "Météo Russe" InIn BBBDD FwTTT BBBDD FWTTT bbbRR
					Where TTT is the temperature of the air in degrees and tenths and bbb is the amount of barometric tendency in tenths of millimetres, 500 being added to indicate negative tendency
					The first two groups refer to 2100 local time of previous day, and the last three groups to 0700 local time of day of issue
				"	(2) "Retardées" InInYY BBBDD FWTTT BBBDD FWTTT bbbRR (YY = day of the month)
	1100	(See notes)	U.W. S.	N.I.C. O.I.C. (mod.)	(3) "Pilot" InIn GG h ₁ ddvv h ₁ ddvv, etc. (Russian ob. not included in the first bulletin, and European ob. at corresponding hours as given under individual countries)
					(1) "Météo Russe" same form as 0915 (1) message above; three index figures and TT instead of TTT being given for stations outside Russia

RUSSIA—contd.

STATIONS:

01 Alexandrovsk†	29 Ufa†	57 Bairam-Ali	112 Stensele	140 Brest
02 Kandalask	30 Elisabetgrad†	58 Krasnovodsk	113 Särna†	141 Rochefort†
03 Kem†	31 Poltava†	59 Askhabad	114 Härnösand†	142 Clermont†
04 Archangel	32 Kharkov	(Poltoratsk)	115 Stockholm	143 Bayonet†
05 Mezen	33 Lugansk	60 Tashkent†	116 Kalmar	144 Toulon
06 Oust-Tzylmat	34 Saratov	61 Alma-Ata	117 Kuopio†	145 Ajaccio
07 Matotchkin-Shar†	35 Orenbourg†	62 Doudinka	118 Helsingfors	146 Geneva
08 Vaigach	36 Odessa	63 V. Imbatskoe	119 Rigat	147 Belgrade
09 Morra Sale	37 Taganrog	64 Eniseisk	120 Skagen†	148 Kishinev†
10 Dickson †	38 Tzaritzyn†	65 Kirensk	121 Stornoway†	149 Bucharest†
11 Obdorsk†	39 Sevastopol†	66 Tomsk	122 Donaghadee	150 Venice
12 Petrograd†	40 Theodosia	67 Bratski-Ostrog	123 Tynemouth†	151 Rome†
13 Padany†	41 Kertch†	68 Barnaul†	124 Valencia†	152 Taranto†
14 Shenkursk	42 Stavropol	69 Irkutsk	125 Holyhead	153 Messina
15 Vologda†	43 Astrakhan	70 Yakutsk	126 Scilly	154 Sofia†
16 Oust-Sysolsk	44 Gouriev	71 Blagoveshchensk	127 Helder	155 Constantinople
17 Tcherdyn†	45 Emba	72 Khabarovsk	128 Hamburg	156 Athens
18 V. Louki	46 Sotchi†	73 Vladivostok	129 Danzig†	157 Candia
19 Yaroslav	47 Batoum	101 Isafjord†	130 Dresden	158 Limassol
20 Viatka	48 Tiflis	102 Seydistjord†	131 Munich†	159 Alexandria
21 Gorky	49 Petrovsk†	103 Thorshavn	132 Vienna†	160 Horta
22 Moscow	50 Baku	104 Spitzbergen†	133 Vilna	161 Corunna
23 N. Novgorod†	51 Tobolsk†	105 Jan Mayen†	134 Warsaw†	162 Madrid
24 Kazan	52 Omsk	106 Brönnöy†	135 Pinsk†	163 Mahon
25 Ekaterinbourg	53 Akmolinsk	107 Ingöy†	136 Lemberg†	164 Agadir
26 Kiev	54 Semipalatinsk	108 Röst	137 Calais†	165 Rabat
27 Koursk	55 F. Alexandrovsky	109 Kinn†	138 Paris	166 Algiers
28 Zemetchino†	(Urityky)	110 Utsire†	139 Mainz†	167 Bizerta
	56 Ak-Mechet	111 Haparanda†		168 Malta

† Synoptic messages.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Moscow, RAI, 5,000 sp.	1300 2210	0700 0700	S. S.	O.I.C. O.I.C.	SYNOPTIC REPORTS. (Name of station and day of week <i>en clair</i> BBBDD FWTTT BBBDD FWTTT bbb (or bbb) RR NOTE: At some stations the barometric tendency is given in the form bbb, and 50 is added to DD when the tendency is negative. (Name of station <i>en clair</i>) "UKRMETA," BBBDD FWTTT bbbRR NOTES: (1) bbb+500 = negative tendency (2) These reports contain a.m. ob. of Russian Ukraine and foreign stations <i>En clair</i> message containing the direction and force of the wind, followed in summer by a forecast for the ensuing 24 hours for the White Sea and the Murman Coast, and in winter by a report concerning ice conditions in the White Sea from Soyatoi Nos to Modyugski
Kiev, RAG, 1,500 c.w.	1400	—	S.	O.I.C. (mod.)	
Archangel (Isakogorka), REA, 2,500 sp.	1300 1400	—	S.I.	p.l.	
RUSSIAN MARITIME PROVINCE					
Khabarovsk, RFN, 1,500	1442	—	—	—	SYNOPTIC REPORTS. As for 0912 message from Vladivostok (below (1) "Met. met. met. de RCV RCV RCV QST name of station" BBBDDF (2) General atmospheric conditions and positions of the centres of typhoons and de- pressions with their probable direction when necessary Repeat of 0912 message above
Vladivostok, RCV, 1,500	0912	—	S.	N.I.C.	
	1412	—	S.	p.l.	
	2212	—	W	—	
			S.W.	—	
			"	—	
					STATIONS: " " "
					Anadir Vladivostok Tokyo
					Naiakhom Fusan Nagasaki
					Petropavlovsk Mukden Nacha
					Okhotsk Shanghai Ishigaki
					Nikolaevsk Amoy Bonin
					(or Jhenkier) Hong Kong Manila
					Khabarovsk Nemori
					Manchuria Chita
					Harbin (or Tsitsikar) Hakodate

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
ERBS, CROATS AND SLOVENES					SYNOPTIC REPORTS.
Belgrade, HFB, 4,600 c.w.	0740	0700	S.	N.I.C.	"Météo SHS" InIn BBBDD FwwTT cbWVH ALANh RRmmr C ₁ ddVV
	1330	1300	S.	N.I.C.	"Météo SHS" InIn BBBDD FwwTT cbWVH ALANh C ₁ ddVV
	1830	1800	S.	N.I.C.	"Météo SHS" InIn BBBDD FwwTT cbWVH ALANh RRMMr C ₁ ddVV
					STATIONS: 01 Belgrade 02 Crikvenica 03 Sarajevo 04 Zagreb (Agram)
IBERIA					SYNOPTIC REPORTS.
Morrasale (Mare-Sale), RCK, 600 sp.	0355	—	S.	O.I.C. (mod.)	BBBDD FWTTT bbbRR
Obdorsk, RAN, 900 sp. . . .	0330	—	S.	"	do. do. do.
Dickson, RFV, 2,500 sp. . . .	0300	—	S.	"	do. do. do.
St Yenisei, RFW, 1,000 . . .	—	—	S.	"	do. do. do.
Ugorski Shar (Strait), RCX, 1,800 sp.	0500	—	S.	"	do. do. do.
Vaigach, RCU, 600 sp. . . .	0410	—	S.	"	do. do. do.
Matochkin Shar (Novaya Zembya), RFU, 2,000 sp.	—	—	S.	"	do. do. do.
SOUTH AFRICA					
Capetown, VNC, 600 sp. . .	0830	0630	S.	N.I.C. (mod.)	InInIn BBBSBr DDFww VsNRRR Stations: VNO East London, VNQ Port Elizabeth, MB Mossel Bay, VNC Capetown, VNJ Port Nolloth, VNV Walvis Bay Forecast for coasts in plain language
Durban, VND, 600 sp. . . .	1115 0810	— 0630	F. S.	p.l. N.I.C. (mod.)	InInIn BBBSBr DDFww VsNRRR Stations: CRT Beira, CRZ Lourenço Marques, VND Durban, VNO East London, VNQ Port Elizabeth Forecast for coasts in plain language
Walvis Bay, VNV, 600 sp. . .	1100 0840	— 0630	F. S.	p.l. N.I.C. (mod.)	InInIn BBBSBr DDFww VNRRR Stations: VNC Capetown, VNJ Port Nolloth, VNV Walvis Bay, CRM Mossamedes, CRL Loanda
Port Elizabeth, VNQ, 600 sp.	1300 2000 0820	— — 0630	F. F. S.	p.l. p.l. N.I.C. (mod.)	Forecast for coast in plain language InInIn BBBSBr DDFww VNRRR Stations: VND Durban, VNO East London, VNQ Port Elizabeth, MB Mossel Bay, VNC Capetown
	1130	—	F.	p.l.	Forecast for coast in plain language

GENERAL NOTE ON CODES.

Meaning of Br.—This figure is only used at Mossuril (refers to the bar at Mozambique Port), Beira, Lourenço Marques (refers to the bar near Inyaca Island), Durban, East London, Mossel Bay and Capetown; at other stations a dash will be inserted in the message. It represents the following:—

At Mossuril, Beira, Lourenço Marques, Durban and East London: State of bar, see Table I below

At Mossel Bay: Instructions regarding anchorage, see Table II below

At Capetown: Run or undertow in Docks, see Table III below

TABLE I.

State of Bar (at Mossuril, Beira, Lourenço Marques, Durban and East London).

Code Figure: 1 Bar smooth 3 Bar rough 5 Bar dangerous
2 Bar breaking slightly 4 Bar breaking heavily 6 Bar impassible

At East London the use of 1, 2 and 3 also implies that work with lighters is possible, and 4, 5 and 6 that it is impossible

TABLE II.

Instructions Regarding Anchorage (at Mossel Bay).

Code Figure: (1) It is recommended that vessels should anchor well up the Bay towards Seal Island in not less than 9 fathoms of water, and veer plenty of cable.

(5) It is recommended that vessels should take up ordinary anchorage with beacons in line in about 7 fathoms of water.

TABLE III.

Run or Undertow (at Table Bay Docks).

Code Figure: 0 No run 1 Slight run 2 Moderate run 3 Heavy run

"Run" is a local term for the undertow, due to a heavy swell in the Bay, which causes vessels to range so heavily along the quays that it is difficult to hold them

RRR. Rainfall in whole millimetres (1 in. = 25.4 millimetres. A rough conversion may be made by multiplying the number of millimetres by 4; the result gives the rainfall, approximately, in hundredths of an inch)

A dash denotes "no observation of the element." In the absence of a report from any station, the station's index letters followed by the words "not received" will be transmitted

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
SPAIN					SYNOPTIC REPORTS.
Carabanchel (Madrid), EGC, 2,650 c.w.	0900	0700	S.	N.I.C. (mod.)	"SME" (SF, LC, MA) InIn BBBDD Fw ₁ w ₁ T c ₁ bbRR C ₁ d ₁ C ₂ d ₂ u d ₁ d ₁ v ₁ v ₁ d ₁ d ₁ v ₁ v ₁ , etc. (Other stations) InIn BBBDD Fw ₁ w ₁ TT C ₁ bbRR C ₁ d ₁ C ₂ d ₂ Nh d ₁ d ₁ v ₁ v ₁ d ₁ d ₁ v ₁ v ₁ etc.
	1530	1300	S.	"	(SF, LC, MA) InIn BBBDD Fw ₁ w ₁ TT c ₁ bbW ₁ W ₁ C ₁ d ₁ C ₂ d ₂ u (Other stations) InIn BBBDD Fw ₁ w ₁ TT c ₁ bbW ₁ W ₁ C ₁ d ₁ C ₂ d ₂ Nh
			S.	"	
			W.	special	"Precaución" Ci LL GG BB or "Pre- caución" Gr LL GG BB DD
	2030	1800	S.	N.I.C. (mod.)	Same as for 0930 message above but contains no upper air ob.

NOTES: (1) Special codes:—
w₁w₁ = present weather
c₁ = characteristic of barometric tendency
C₁, C₂ = forms of cloud to which d₁ and d₂
refer
Nh = cloudiness of horizon
d₁d₁ = direction of upper wind
v₁v₁ = speed of upper wind
d₁ = direction of motion of low cloud
(scale 0-9. 0 = no cloud; 1 =
from N.E.; 2 = from E., etc.
9 = no observation)
d₂ = direction of motion of high cloud on
same scale as d₁
bb = amount of barometric tendency
(millibars and tenths per three
hours)
u = sea disturbance in Old International
Code (page 393)

The remaining symbols have the same
significance as in the New International Code.
If a figure is missing from a set of observations,
the letter "x" is inserted in its place

If a complete set of observations is missing
the word "falta" is transmitted after the
index letters of the station.

Characteristic of Barometric Tendency (c₁)

Code

- | | |
|-----------------------|-----------------------|
| 0 Steady | 5 Falling |
| 1 Rising | 6 Falling then steady |
| 2 Rising then steady | 7 Falling then rising |
| 3 Rising then falling | 8 Rising or steady, |
| 4 Falling or steady, | then falling |
| then rising | 9 Line squall |

Form of High Cloud (C₂)

Code

- | | |
|-----------------|-----------------------|
| 0 No high cloud | 5 Thin alto-stratus |
| 1 Cirrus | 6 Thick alto-stratus |
| 2 Cirro-stratus | 7 Alto-cumulus (low) |
| 3 Cirro-cumulus | 8 Alto-cumulus (high) |
| 4 False cirrus | |

Form of Low Cloud (C₁)

Code

- | | |
|-----------------------|------------------|
| 0 No low cloud | 5 Nimbus |
| 1 Fracto-cumulus | 6 Cumulus |
| 2 Mammato-cumulus | 7 Cumulo-nimbus |
| 3 Low strato-cumulus | 8 Stratus |
| 4 High strato-cumulus | 9 No observation |

Cloudiness of Horizon (N.)

Code

- 0 All the horizon without cloud
- 1 Clouds in the North part of the horizon
- 2 Clouds in the East part of the horizon
- 3 Clouds in the South part of the horizon
- 4 Clouds in the West part of the horizon
- 5 All the horizon covered with clouds except
the first quadrant
- 6 All the horizon covered with clouds except
the second quadrant
- 7 All the horizon covered with clouds except
the third quadrant
- 8 All the horizon covered with clouds except
the fourth quadrant
- 9 All the horizon covered with cloud

Upper Winds (d₁d₁v₁v₁)

These are reported by five groups each of the
form d₁d₁v₁v₁, referring respectively to the
five heights 250, 500, 1000, 2000, and 3000
metres.

d₁d₁ = wind direction (scale 01-32; where
08 = E.; 16 = S.; 24 = W.;
32 = N.)

v₁v₁ = velocity of wind in metres per
second

(2) (W). *Special Code.*—The storm warn-
ings preceded by the word "precaución"
followed by either the letters CL (indicating
cyclonic depression) or Gr (indicating a squall).
Where LL = lat. in degrees of the centre of
the depression, GG = longitude (50 is added
to the number for longitudes East of Greenwich)
of the centre of the depression, BB = baro-
meter in mb.; DD = direction in which squall
is proceeding (scale 0-32)

Stations:—

MD	Madrid	CD	Cordova
LC	Corunna	AI	Alicante
SF	San Fernando	AL	Almeria
BA	Barcelona	ME	Melilla
SA	Santander	TE	Tetuan
VD	Valladolid	IZ	Izana (Tenerife)
ZA	Saragossa	BI	Bilbao (Algorta)
MA	Mahon	MG	Malaga
BD	Badajoz	VA	Valencia
LA	Larache	SE	Seville

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
PITZBERGEN					
pitzbergen, LFG, 1,600 ..	0700 1300 1800	— — —	— — —	— — —	SYNOPTIC MESSAGES (see Christiania) Also transmits to ships on request a report of the state of the weather
SWEDEN					
Karlsborg SAJ, 4,200 cw. ..	0740	0700	S.	N.I.C.	
			U.W.	"	SYNOPTIC REPORTS. "Météo Suède" (1) (03) InIn BBBDD FwwTT cbWVH ALaNH RRmmr C ₁ ddVV (2) (Other stations—inland) InIn BBBDD FwwTT cbWVH ALaNH RRmmr (Other stations—Coastal) InIn BBBDD FwwTT cbWVH ALaNH RRSVsr (3) "Pilot" (03, 22, 37, 44) InIn h ₁ ddvv h ₁ ddvv, etc.
	1340	1300	S.	N.I.C.	(1) (03) InIn BBBDD FwwTT cbWVH ALaNH C ₁ ddVV (2) (Other stations) InIn BBBDD FwwTT cbWVH ALaNH
	1840	1800	U.W. S.	N.I.C.	(3) "Pilot" as for 0740 (3) message above As for 0740 (1) and (2) message
					NOTES: (1) Stations in capitals are alone transmitted normally. Should any be missing others from the list are inserted. (2) VV—Speed is given in metres per sec. (3) Observations of upper air temperature and humidity transmitted at the end of the Swedish synoptic messages are in the code:—

Stations:

01 Karesuando (L)	36 KARLSTAD (L)
02 Riksgränsen (L)	37 STOCKHOLM (L)
03 ABISKO (L)	38 Orebro (L)
04 Kiruna (L)	39 Strömstad (L)
05 Suorvajaure (L)	41 Askersund (L)
07 Gällivare (L)	42 Nyköping (L)
09 Jockmock (L)	44 Linköping (L)
10 Boden	45 Skara (L)
11 HAPARANDA (L)	46 Vänersborg (L)
14 Piteå (L)	47 Ulricehamn (L)
15 STENSELE (L)	48 JONKOPING (L)
16 Gäddede (L)	49 Västervik (L)
19 Umea (L)	50 Borås (L)
21 Storlien (L)	51 Göteborg (L)
22 Ostersund (L)	52 WISBY (C)
24 HARNOSAND (C)	55 Växjö (L)
26 Sveg (L)	57 Halmstad (C)
27 Bjuråker (L)	58 KALMAR (C)
28 SARNA (L)	59 Karlshamn (C)
30 Gävle (L)	61 Kristianstad (L)
31 Falun (L)	62 Lund (L)
32 Gustafsfors (L)	63 Malmö (L)
34 Uppsala (L)	65 Bjuröklubb (C)
35 Västerås (L)	78 Olands Norra Udde (C)

GGU₁U₂ OOTTT PPBBB HHTTT PPBBB
where GG = Hour of observation (G.M.T.)

U₁ and U₂ are to be decoded as follows:—

U₁ 5 = kite ascent

6 = captive balloon ascent

7 = aeroplane ascent

8 = ballon-sonde ascent

U₂ 3 = observations during ascent

4 = observations during descent

5 = mean of observations during ascent
and descent

6 = no indication whether data relate to
ascent or descent

8 = observations uncertain

HH = height above sea-level in hundreds
of metres

TTT = corresponding temperature in
degrees and tenths Centigrade

PP = corresponding relative humidity
(99 = 100 per cent.)

BBB = corresponding pressure in whole
millimetres

The second and third groups (OOTTT
PPBBB) relate to conditions at the level of
the station

The stations concerned are:—

44 Malmslätt 58° 25' N. 15° 32' E., altitude
115 m.

(1)	(2)	(3)	(4)	(5)	(6)
Karlsborg SAJ, 2,500 sp. ..	1215	0700	S.	O.I.C.	SYNOPTIC REPORT issued by the Statens Meteorologisk-Hydrografiska Anstalt (Stock- holm) (1) "Weather Report" (station letter) BBBDD FVTTS (2) Bar-pressure and changes in Europe <i>en clair</i> (English) (3) "Forecasts" ddynt ddynt, etc. (4) "Gale warning" g ₁ g ₂ g ₃ g ₄ g ₅
		0700	S.	p.l.	
			F.	special	
			W.	"	

SWEDEN—contd.

NOTES: (1) V = State of sky or weather (W in O.I.C.)

(2) Stations and code letters for part (1) of message—Röst (R), Kinn (K), Utsire (U) Hanstholm (Hm), Vinga (V), Hammershus (Bornholm) (Hs), Gotska Sandön (G), Bremö (B)

(3) Forecasts in part (3) refer to the following areas:

N = Eastern portion of North Sea

V = West Coast of Sweden.

Oe = Baltic

B = Gulf of Bothnia

(4) dd = Wind direction according to the following code:

Wind.	Direction between—				
	N.-E.	N.E.-S.E.	E.-S.	S.E.-S.W.	S.-W.
Light	01	06	11	16	21
Moderate	02	07	12	17	22
Fresh	03	08	13	18	23
Strong	04	09	14	19	24
Storm	05	10	15	20	25

Wind.	Direction between—			
	S.W.-N.W.	W.-N.	N.W.-N.E.	Variable.
Light ..	26	31	36	41
Moderate	27	32	37	42
Fresh ..	28	33	38	43
Strong	29	34	39	44
Storm	30	35	40	45

00 = very light wind or calm.

y = forecast of alteration in the direction or force of the wind as follows:

- 0—No forecast
- 1—Unchanging
- 2—Increasing
- 3—Decreasing
- 4—Shifting to the right
- 5—Shifting to the left
- 6—Gradually increasing
- 7—Gradually decreasing
- 8—Gradually shifting to the right
- 9—Gradually shifting to the left

n=forecast regarding rain, as follows:

- 0—Fair weather
- 1—None or little rain
- 2—Rain in some places
- 3—Rain in several places
- 4—Rain at most places
- 5—Rain everywhere
- 6—Showers in most places (snow squalls in winter)
- 7—Showers in several places (snow in winter)
- 8—Showers in some places (snow in winter)
- 9—Fog probable

“t”=forecast regarding changes in temperature, according to the following scale:

- 0—Unchanged
- 1—Rising
- 2—Gradually rising
- 3—Falling
- 4—Gradually falling
- 5—About mean temperature
- 6—Above mean temperature (more than 3°)
- 7—Below mean temperature (more than 3°)
- 8—Probable thaw
- 9—Probable frost

x=no information

(5) In part (4) of message, g₁=Skagerrak, g₂=Kattegat, g₃=South Baltic, g₄=North Baltic, g₅=Gulf of Bothnia

Scale for g:

- 0—No storm warning
- 1—Gale (7-10 Beaufort) from a direction between north and west.
- 2—Gale (7-10 Beaufort) from a direction between south and west
- 3—Gale (7-10 Beaufort) from a direction between north and east
- 4—Gale (7-10 Beaufort) from a direction between south and east
- 5—Gale (7-10 Beaufort) without given direction
- 6—Storm (11-12 Beaufort) from a direction between north and west
- 7—Storm (11-12 Beaufort) from a direction between south and west
- 8—Storm (11-12 Beaufort) from a direction between north and east
- 9—Storm (11-12 Beaufort) from a direction between south and east

The letter “x” will replace a symbol to indicate missing data

(6) Storm warnings are valid until 0700 G.M.T. the following day

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Boden SAI	request	—	—	p.l.	Bulletins from Central Meteorological Station; charge 7.50 francs (3 kronor).
Hernösand SAH					
Vaxholm SAF					
Gotland SAE					
Karlskrona, SAA					
Göteborg, SAB					
(All 600 sp.)					
Hernösand, SAH, 600 sp. ..	1655	—	W.	p.l.	Storm warnings <i>en clair</i> (English) for the Gulf of Bothnia
Vaxholm, SAF, 600 sp.	2155	—	W.	p.l.	Storm warnings <i>en clair</i> (English) for the North and South Baltic
Göteborg, SAB, 600 sp. ..	1650	—	W.	p.l.	Storm warnings <i>en clair</i> (English) for the Skagerrak and Kattegat
	2150	—	W.	p.l.	
	1700	—	W.	p.l.	
	2200	—	W.	p.l.	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
SWITZERLAND					
Lausanne, HB2, 1,100 c.w...	0700 } 1300 } 1800 }	—	—	—	Aviation reports
Lausanne Champ de l'Air, HB2, 1,100 R/T ..	1200 } 1755 } 0608 }	—	F. F.	p.l. p.l.	Daily forecasts from Zurich and Lausanne ob. (Sunday excepted)
Dubendorf, HBK, 1,980 c.w.	0708 } 0808 } etc. }	—	—	—	Synoptic reports for aviators are sent at 08 min. past the hour until 1308 G.M.T. daily
SYRIA					
Djedeide (Beirut), UAB, 6,100 c.w.	0850 } 1950 }	0100 } 1800 }	S. S.	French Met. —	SYNOPTIC REPORTS "Météo Syrie" InIn BBBTT cbbP DDFN cb ₁ b ₁ jj DDFNV ddF'nh w ₁ w ₁ AP ₁ A ₂ mmRRd (This message is repeated from Bizerta (Tunis) at the end of the 0920 message from that station) "Météo Syrie" InIn BBBTT cb ₁ b ₁ jj DDFNV ddF'nh A ₁ w ₁ P ₁ w ₁ A RRt ₂ t ₂ d ₃

NOTE : See under French Meteorological Code and Eiffel Tower Synoptic Reports (page 656) for code details.

STATIONS :					
01 DAMASCUS	04 Rakka	07 Homs	10 Rayack	15 DJEDEIDE	
02 MUSLIMIE	05 Hasseitje	08 Deraa	11 Ksara	16 LATAKIA	
03 DEIR-ES-ZOOR	06 Palmyra	09 Sorveida			

(1)	(2)	(3)	(4)	(5)	(6)
TUNIS					SYNOPTIC REPORTS
Bizerta (Sidi-Abdallah), FUA, 3,600 c.w.	0120 } 0920 }	0100 } 0700 }	S. S.	French Met. Code	(1) "Météo Bizerte" (61 only) InIn BBBTT cbbP DDFNV (1) "Météo Afrique" (01-69) InIn BBBTT cb ₁ b ₁ jj DDFNV ddF'nh w ₁ w ₁ PA ₁ A ₂ RRd ₃ (2) "Pilot" InInGG ddf ddf ddf, etc. (3) "Navires" Q"LLX ₁ Pllx ₂ BBDDx ₃ FrKdx ₄ wwGGx ₅ y ₁ y ₂ y ₃ y ₄ z (4) "Météo Syrie" Repeat of 0850 message issued from Djedeide-Levant Synoptic Report. (See under Syria) (1) "Météo Bizerte" (61-69) InIn BBBTT cbb(SV _s) DDFNV ddF'nh w ₁ w ₁ PA ₁ A ₂ (1) "Météo Bizerte" (61-69) InIn BBBTT cbb(SV _s) DDFNV ddF'nh w ₁ w ₁ PA ₁ A ₂ MMT ₂ t ₂ d
		0700 }	U.W.	"	
		—	O.	"	
		0700 }	S.	"	
	1330 }	1300 }	S.	—	
	1830 }	1800 }	S.	"	

NOTES : (1) See under French Meteorological Code and Eiffel Tower Synoptic Reports (page 656) for code details.

(2) Stations 07 and 15 send index number and first three groups only of "surface" ob.

STATIONS :					
01 TANGIER	13 Marrakesh	34 BISKRA	43 El-Goléa	66 Ben Gardane	
03 RABAT	14 Asaka	35 Touggourt	44 El-Oued	67 Susa	
04 Casablanca	15 BU DENIB	36 Ouargla	45 Ghardaia	68 Metlaoui	
06 Mogador	16 Kasbah Tadla	37 In-Salah	46 Adrar	69 Qabes	
07 AGADIR	17 Guereif	38 Colomb-Béchar	61 TUNIS	80 Funchal	
09 Meknes	18 Timadit	39 Béni-Abbes	62 BIZERTA	81 Angra	
10 FEZ	31 ORAN	40 Timimoun	63 Sfax	82 Port Etienne	
11 Taza	32 ALGIERS	41 Laghwat	64 Medinine	83 Dakar	
12 Ujda	33 SETIF	42 Aïn-Sefra	65 Tozeur		

(1)	(2)	(3)	(4)	(5)	(6)
Bizerta, FUA, 1,350 sp.	1200 }	0700 }	S.	N.I.C.	"Météo Alger 3" (61- InIn BBDDF wb ₁ (SV ₁) State of weather <i>en clair</i> Forecast for North Africa <i>en clair</i> Repetition of 1145 from Oran LIST OF OBSERVATIONS STATION. Code. Name. Code. Name. SFX Sfax† ALG Algiers† BZR Bizerta† TNS Tenès† GAR Cap de Gardet† NEM Nemours† CST Constantine CLB Colomb Béchar FAL Cap Falcon† LAG Laghouat TGR Tangier† TOU Touggourt RAB Rabat† († These stations transmit SV ₁ .)
		—	S.	p.l.	
		—	F.	"	
		—	—	—	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
TUNIS—contd.					
Bizerta-Seti Meriem, FFW 600 sp.	request	see notes	S.	p.l.	<i>En clair</i> message (French), giving the latest ob. (either at 0700, 1300 or 1800 G.M.T.) at Cap Blana. The following details are given: Bar. pressure and tendency in m.m., wind direction and force, state of the sky, visibility in km., and state of sea. Synoptic report for Tunis.
Bizerta (Sidi Abdallah), FUA 3,600 c.w.	0721	—	—	—	

U.S.A.

Masters of all vessels are reminded that all communications concerning weather should be forwarded to the Weather Bureau, Washington, D.C., and if sent by radio or telegraph should be addressed "Govt. Observer."

Under the subject "Weather" should be included all information of a meteorological nature, including reports on barometric pressure, winds, force and direction, and movements of all air strata. Forms and instructions for reports can be obtained from the Weather Bureau, Washington, D.C.

NOTE: ALL STATIONS TRANSMIT THE FOLLOWING MESSAGES DAILY, INCLUDING SUNDAYS AND HOLIDAYS.

(1)	(2)	(3)	(4)	(5)	(6)
					SYNOPTIC—MAJOR BULLETIN.
San Francisco (Calif.); NPG, At 0330 and 0600, 1,330 c.w.; at 0330, 4,836 c.w.; at 1700, 7,006 c.w.	0330 0600	0100	S. U.W. W. F.	American Code p.l.	"U.S.W.B." (United States Weather Bureau) In or InInIn or InInIn BBBDF W'bwAC 3D ₁ V ₁ D ₂ V ₂ D ₃ V ₃ D ₄ V ₄ etc. The second part of the bulletin consists of: synopsis of general atmospheric pressure distribution, including the locations of High and Low areas, and the barometer readings at their centres; wind and weather forecasts for Pacific offshore areas for a period of 24 hours beginning at 1700 G.M.T.; storm warnings for these areas and flying weather forecasts for each of three aviation zones (see map) for a period of 12 hours. As 0330 message (above) As 0330 message (above) As 0330 message (above)
San Francisco (Calif.), NPG, 1,330 c.w.	1700 0400 0800 1200 1600 2000	1300	S. W. F.	American p.l. p.l.	<i>En clair</i> message of the weather condition in the Bonita Channel is sent every 4 hours

NOTES: (1) Alaskan reports included in the 0330 message are ob. taken at 1700; and those included in the 1700 morning message are ob. taken at 0500

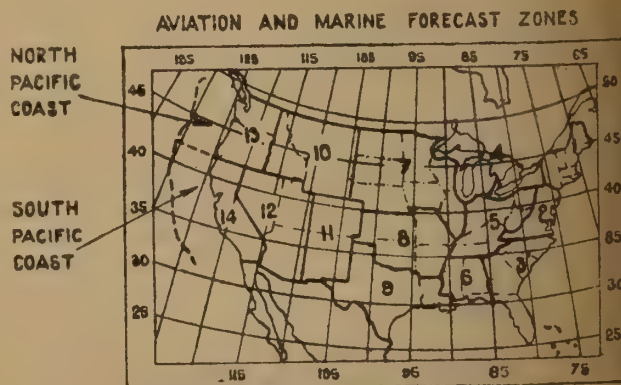
(2) The Honolulu report included in the 0330 message is an ob. taken at 1830 and that included in the 1700 message one taken at 0630

(3) Stations in capitals are those from which upper air obs. are included regularly in the 0330 message and in the 1700 message when obtained in time. When upper air obs. are not possible because of dense fog, rain or snow, the word FOGGY, RAIN or SNOW, as the case may be, will be sent instead of the third group.

(4) Barometric tendency reports are not received from all stations and no cloud reports from the Alaskan, Canadian, and some United States stations. The missing data in this group will be represented by the appropriate number of X's

(5) The second part of the bulletin is in plain language and consists of a synopsis of general pressure distribution; wind and weather forecasts for ocean zones for a period of 24 hours beginning at 1700 G.M.T. day of issue; storm warnings; and flying weather forecasts by zones for a period of 12 hours

(6) The letter "X" will be substituted for any missing data



AVIATION FORECAST ZONES IN BLACK
MARINE FORECAST ZONES SHOWN DOTTED

S.A.—con'd.

ATIONS :

ALASKA :	SE SEATTLE, WASH	DI SAN DIEGO, CALIF.	PH Phoenix, Ariz.
Dutch Harbor	NH North Head, Wash.	HL Helena, Mont.	YU Yuma, Ariz.
Eagle	PD Portland, Oreg.	BS Boise, Idaho	HO Honolulu, T.H.
Juneau	RO Roseburg, Oreg.	LD Lander, Wyo.	
Nome	EUR Eureka, Calif.	WM Winnemucca, Nev.	CANADA :
Sitka	RB Red Bluff, Calif.	R Reno, Nev.	
Tanana	SM SACRAMENTO, CALIF.	SLC Salt Lake City, Utah	ED Edmonton, Alberta
Valdez	SF SAN FRANCISCO, CALIF.	MD Modena, Utah	KA Kamloops, B.C.
UNITED STATES :	FN Fresno, Calif.	DV Denver, Colo.	CY Calgary, Alberta
	SLO San Luis Obispo, Calif.	GJ Grand Junction, Colo.	SC Swift Current, Sask.
AT Tatoosh Is., Wash.	LA LOS ANGELES, CALIF.	SA Santa Fé, N. Mex.	PR Prince Rupert, B.C.

The names of the aerological stations are not included in the bulletin. Observations therefrom are made a part of the report of the nearest regular Weather Bureau station. The location of the aerological stations, the service that conducts them, and the surface stations with which the data are coded, are as follows :—

Aerological stations.	Conducted by	Surface stations, with which upper air reports are included.
North Island, Calif.	U.S. Navy	San Diego, Calif.
Ross Field, Calif.	Signal Corps, U.S.A.	Los Angeles, Calif.
San Francisco, Calif.	U.S. Weather Bureau	San Francisco, Calif.
Mather Field, Calif.	Signal Corps, U.S.A.	Sacramento, Calif.
Camp Lewis, Wash.	Signal Corps, U.S.A.	Seattle, Wash.

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Annapolis, NSS, 17,150 c.w.	0530	(See notes)	—	—	<p>THE "ANGOT" WEATHER BULLETINS.</p> <p>The United States Weather Bureau sends each evening, Sundays and holidays included, to the French Meteorological Service at Paris, a bulletin containing observations taken at a number of stations in the United States, Alaska, Canada, Nova Scotia, Newfoundland and Bermuda, the position at the same hour of dominating high and low pressure areas, and weather reports from a limited number of ships in the North Atlantic Ocean. All land observations are taken at 0000, except Alaskan reports, which are taken at 2100 G.M.T., current date. The bulletin is addressed to "Angot, Paris," and is forwarded through the United States Naval W/T station at Annapolis to Lyons (YN) W/T station. The transmissions are made as the first message in the Annapolis schedule with France. This schedule begins at 0530 G.M.T., and transmission commences as soon thereafter as communication with Lyons can be established</p> <p>(Land stations) In or InIn or InInIn BBBDF</p> <p>(Ship reports) (Ship Call signal) PQLLL lllGG BBBDF TTC followed by centres of predominating high and low pressure areas in the form (name of station) BBBDF</p> <p>NOTES: See under France-Eiffel Tower International Collective Reports</p> <p>Although the "Angot" bulletins are specially addressed to the French Meteorological Service, they are intended for general benefit and ships are at liberty to intercept them during transmission and to use the information contained therein</p>
			S.	N.I.C.	
			O.	"	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
U.S.A.—contd.					SYNOPTIC—MAJOR BULLETINS.
Arlington (Va.), NAA 5959 c.w.	0330	0100	S.	Ameri- can	} As for 0330 message from San Francisco above (q.v.)
			U.W.	„	
			W.	p.l.	
	1530	1300	F.	„	} As above
			S.	Ameri- can	
			U.W.	„	
			W.	p.l.	
			F.	„	

STATIONS:—

J	St. John's, N.F.	MG	Montgomery, Ala.
S	Sydney, N.S.	VK	Vicksburg, Miss.
CK	Cochrane, Ont.	NO	New Orleans, La.
FP	Father Point, Que.	LR	Little Rock, Ark.
ML	Montreal, Que.	GV	Galveston, Tex.
E	Eastport, Me.	NV	Nashville, Tenn.
N	Northfield, Vt.	CN	Cincinnati, Ohio
T	Nantucket, Mass.	PB	Pittsburgh, Pa.
NY	NEW YORK, N.Y. (Upper air Rockaway).	F	Buffalo, N.Y.
AC	ATLANTIC CITY, N.J. (Upper air Lakehurst)	D	Detroit, Mich.
WA	WASHINGTON, D.C. (Upper air Washington)	L	Alpena, Mich.
NF	NORFOLK, Va. (Upper air Hampton Roads)	M	Marquette, Mich.
LB	Lynchburg, Va.	CH	Chicago, Ill.
AV	Asheville, N.C.	DU	Duluth, Minn.
H	Hatteras, N.C.	LC	La Crosse, Wis.
C	CHARLESTON, S.C. (Upper air Parris Island)	SL	St. Louis, Mo.
B	Bermuda	KC	Kansas City, Mo.
CO	COLUMBIA, S.C. (Upper air Due West).	O	OMAHA, Nebr. (Upper air Fort Omaha).
JA	Jacksonville, Fla.	OK	Oklahoma City, Okla.
K	KEY WEST, Fla. (Upper air Key West)	DA	Dallas, Tex.
AT	Atlanta, Ga.	EP	El Paso, Tex.
TA	Tampa, Fla.	HT	Horta, Azores
P	PENSACOLA, Fla. (Upper air Pensacola)		

The names of the aerological stations are not included in the bulletin. Observations therefrom are made a part of the report of the nearest regular Weather Bureau station. The location of the aerological stations, the service that conducts them, and the surface stations with which the data are coded are as follows:—

Aerological stations.	Conducted by	Surface stations, with which upper air reports are included.
Rockaway, N.Y. ..	U.S. Navy ..	New York, N.Y.
Lakehurst, N.J. ..	U.S. Navy ..	Atlantic City, N.J.
Washington, D.C. ..	U.S. Weather Bureau ..	Washington, D.C.
Hampton Roads, Va. ..	U.S. Navy ..	Norfolk, Va.
Parris Island, S.C. ..	U.S. Navy ..	Charleston, S.C.
Due West, S.C. ..	U.S. Weather Bureau ..	Columbia, S.C.
Pensacola, Fla. ..	U.S. Navy ..	Pensacola, Fla.
Key West, Fla. ..	U.S. Weather Bureau ..	Key West, Fla.
Omaha, Nebr. ..	Signal Corps, U.S.A. ..	Fort Omaha, Nebr.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Arlington (Va.), NAA, 5,959 c.w. for 1530 message and 2,655 c.w. for 0300 message	0300 1530	— —	F. F	— —	Separate weather forecasts for each of the States east of the Mississippi river except Indiana, Wisconsin and Illinois. A general forecast will also be included NOTE: On Wednesdays, from April to October 15th a summary of the previous week's meteorological conditions is included in these messages

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes
(1)	(2)	(3)	(4)	(5)	(6)
J.S.A—contd. Blunts Reef Light Vessel (Calif.), NACT, 600 sp.	0400 1600 2000	— — —	— — —	— — —	Broadcasts weather reports pertaining to existing weather conditions in the immediate vicinity of the light vessel. Forecasts cannot be furnished Also transmitted on request
Boston (Mass.), NAD, 1,363 c.w.	1600	—	F.W.	—	
		1300	S.	—	
	2200	—	W.	—	LOCAL BULLETINS. FW = Forecast and storm warnings for the coast of New Hampshire, Massachusetts and Rhode Is. Advisory messages issued for the North Atlantic Coast S = Bar. pressure, wind direction and force and state of weather at Highland Light, Nantucket and Block Is. As above

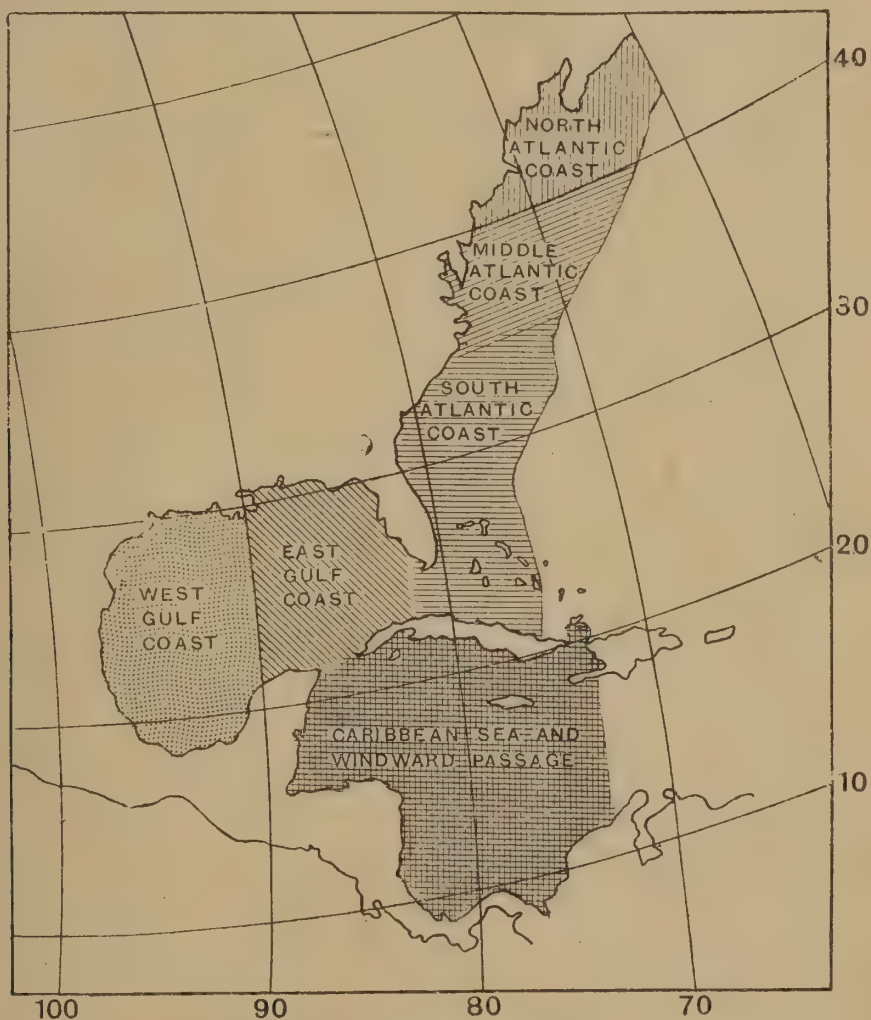


Chart of U.S.A. Forecast Zones.

(1)	(2)	(3)	(4)	(5)	(6)
Brownsville (Tex.), NAY, 5,000 c.w.	0500	0100 (See notes)	S. F. W.	Ameri- can p.l. p.l.	SYNOPTIC REPORTS. InIn BBBDF Wind and weather forecasts for Gulf Coast and Caribbean Sea and Windward Passage valid for 24 hours (<i>en clair</i> message) Storm warnings for Gulf of Mexico, Key West to Brownsville; location and expected movement of storm centres affecting Gulf of Mexico; all hurricane warnings and advices

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
U.S.A.—contd.					(1) Ob. are made 1 hour earlier at stations in Gulf of Mexico and Caribbean Sea (2) Messages sent daily from June 1st to November 30th STATIONS: Key West, Fla. K Galveston, Tex. GV Tampa, Fla. TA Corpus Christi, Tex. CC Pensacola, Fla. P Brownsville, Tex. BV Mobile, Ala. MO Kingston, Jamaica KN Burrwood, La. BW Swan Island SI
Brownsville (Tex.), NAY, 2,255 sp.	0000 1700	— —	W. F.W.	— —	LOCAL BULLETIN. W = Storm warnings and advices FW = Forecast and storm warnings for the coast of Texas from Corpus Christi to Brownsville; advisory messages relating to warnings issued for the West Gulf Coast NOTE: Hurricane warnings and advisory messages relating thereto when issued are repeated every two hours until 0500 G.M.T. Weather Bureau Station: Brownsville
Charleston (S.C.), NAO, 2,607 sp.	1530	— 1300 2300	F.W. S. W.	p.l. — "	LOCAL BULLETIN FW = Forecast and storm warnings for the coast of South Carolina; advisory messages relating to warnings in the middle and south Atlantic and east Gulf Coasts S = Bar. pressure, direction and force of wind and state of weather at Charleston Storm warnings and advices as above Weather Bureau Station: Charleston (S.C.)
Eureka (Calif.), NPW, 2,205 sp.	0130 1700	0100 1300	S.W. F.S. W.	— — —	FW = Wind and weather forecasts and storm warnings for California Coast north of San Francisco; advices concerning storm warnings for North Pacific Coast S = Bar. pressure, wind direction and force and state of weather at Eureka W = At 1700 and 2200: storm warning for coast of California north of San Francisco and advices concerning warnings for North Pacific Coast
	2200	—	—	—	
	request	—	—	—	
Galveston (Tex.), NKB 1,817 sp.	1630	— 1300 2300	F.W. S. W.	p.l. — —	LOCAL BULLETIN. FW = Forecast and storm warnings for the coast of Texas from Port Arthur to Corpus Christi; advisory messages relating to storm warnings issued for the West Gulf Coast S = Bar. pressure, direction and force of wind and weather at Galveston Storm warnings and advices as above NOTE: Hurricane warnings issued when necessary and repeated every 2 hours until 0500 G.M.T. Weather Bureau Station: Galveston
Jupiter (Fla.), NAQ, 1,304 sp.	1630	— 1300 2300	F.W. S. W.	p.l. " "	FW = Forecast and storm warnings for east coast of Florida (Miami to Key West); advisory messages relating to storm warnings issued for the middle and south Atlantic and east Gulf Coast S = Bar. pressure, direction and force of wind and weather at Miami Storm warnings and advices as above NOTE: Hurricane warnings and advisory messages relating thereto are transmitted when necessary and repeated every 2 hours until 0500 G.M.T. Weather Bureau Station: Jacksonville, Fla.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) S.A—contd.	(2)	(3)	(4)	(5)	(6)
Key West (Fla.), NAR, 5,700 c.w.	0300	0100	S. F. W	Ameri- can p.l. p.l.	SYNOPTIC REPORTS. InIn BBBDF Wind and weather forecasts for 24 hours for Atlantic Coast (Hatteras to Key West), East and West Gulf Coast, Caribbean Sea and Wind- ward Passage. <i>En clair</i> messages (English) Location and expected movement of storm centres affecting Atlantic Coast south of Hatteras and Gulf of Mexico. Storm warnings for Gulf Coast, Key West to Brownsville. All hurricane warnings and advices NOTES: (1) Obs. are made 1 hour earlier at Gulf of Mexico and Caribbean Sea stations

STATIONS:—

Hatteras, N.C. H	Key West, Fla. K	Brownsville, Tex. BV	Havana, Cuba HA
Charleston, S.C. C	Pensacola, Fla. P	Fort Worth, Tex. FW	Guantanamo Bay, Cuba GO
Jacksonville, Fla. JA	Burrwood, La. BW	Kingston, Jamaica KN	Swan Island SI
Miami, Fla. MI	Galveston, Tex. GV	Turks Island TI	San Juan, P.R. SJ

(1) New Orleans, NAT, 2,607 sp.	(2) 1530	(3) 1300	(4) S.F.	(5) p.l.	(6) A summary of meteorological conditions over the United States. This message includes a forecast for Louisiana, Arkansas, Oklahoma, Eastern Texas (east of the 100th meridian) and Western Texas (west of the 100th meridian); winds off the Louisiana and Texas coasts; forecasts on the Ouachita and the lower Red and Mississippi rivers
	1600	1300	F.W.	"	LOCAL BULLETINS. FW = Forecasts and storm warnings for the coasts of Louisiana and Texas from Bay St. Louis to Port Arthur; advisory messages relating to storm warnings for the South Atlantic and Gulf Coasts S = Bar pressure, direction and force of winds and state of weather at Burrwood and Port Arthur Storm warnings and advices as above NOTE: Hurricane warnings as issued every 2 hours until 0500 G.M.T. Weather Bureau Station: New Orleans
New Orleans, WNU, 3,331 c.w.	0300	0100	S.	—	S = Bar. pressure, state of the weather, direction and force of wind at Burrwood, Port Arthur and Galveston F = Forecast for Louisiana and Texas coasts W = Storm and hurricane warnings for Louisiana and Texas coasts and advices relating to warnings issued for Atlantic and Gulf coasts Weather Bulletins for shipping in the Carib- bean Sea which is transmitted to Swan Is. W/T station
	0430 1630	— —	— —	— —	
New York, NAH, 1,540 c.w.	1530	—	F.	—	F = Forecasts for (1) the coasts of New York and Connecticut, and (2) from Sandy Hook to the Grand Banks for European steamers S = Ob. of bar. pressure, wind and state of weather at Sandy Hook W = Storm warnings for the coasts of New York and Connecticut; advisory messages regarding warnings issued for the north and middle Atlantic Coasts
	2200	—	W.	—	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
U.S.A.—contd.					
Norfolk, NAM, 1,360 sp., 1,395 c.w. for 0130 message	0100 0130	— 0100	W. S.	— —	S = Bar. pressure, state of weather, direction and force of wind, condition of sea and visi- bility at Cape Henry and Cape Hatteras
	1545	—	F. W.	— —	FW = Forecast and storm warnings for the coasts of Virginia and North Carolina. Advisory messages regarding storm warnings for Chesa- peake Bay and middle and south Atlantic coasts
	2100	—	W.	—	—
	2330	2300	S.	—	NOTE: Advisory messages regarding hurri- canes are issued when necessary and repeated every 2 hours until 0500 G.M.T.
North Head, NPE, 2,726 sp.	0130 0530 1330 1730 2130	— — — — —	S.W. F.W. S. F.W. S.W.	— — — — —	F = Wind and weather forecasts and storm warnings for Washington and Oregon Coasts and mouth of Columbia River; advices con- cerning storm warnings issued for North Pacific Coast S = Current bar pressure, wind direction and velocity and state of weather at North Head W = Storm warnings for the coasts of Wash- ington and Oregon and Columbia River en- trance; followed by advices concerning storm warnings issued for the North Pacific Coast NOTE: These reports are also issued on request NOTE: Hurricane warnings as issued every 2 hours
Pensacola, NAS, 1,333 sp. ..	1645	—	F.W.	p.l.	FW = Forecast and storm warnings for the coasts of Florida, Alabama and Mississippi from Apalachicola to Bay St. Louis; advisory messages relating to storm warnings issued for the South Atlantic and Gulf Coasts
	—	1300	S.	,,	S = Current bar. pressure, direction and force of wind and state of weather at Pensacola
	2300	—	W.	,,	Storm warnings and advices as above NOTE: Hurricane warnings transmitted when necessary and repeated every 2 hours until 0500 G.M.T. Weather Bureau Station: Pensacola
Philadelphia, NAI, 1,300 c.w.	1545	—	F.W.	—	FW = Forecast and storm warnings for the coasts of New Jersey, Delaware and Maryland; advisory messages regarding storm warnings for the north and middle Atlantic coasts
	—	1300	S.	—	S = 1300 ob. of wind and state of weather at Delaware breakwater.
	2200	—	W.	—	As above
Portland, Me., NAB, 1090 sp.	1700	—	F.W.	—	FW = Forecast and storm warnings for the coast of Maine from Eastport to Portsmouth; advisory messages regarding warnings issued for the North Atlantic Coast
		1300	S.	—	S = Bar. pressure, direction and wind force and state of weather at Portland
	0100	—	F.S.	—	As above

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
U.S.A.—contd.					
Port Arthur (Tex.), WPA, 600 sp. (June 1st-Nov. 31st inclusive)	1645	—	S. W.	Ameri- can p.l.	SYNOPTIC REPORTS. In In BBBDF Winds and storm warnings over West Gulf of Mexico; all hurricane warnings and advices when issued STATIONS: Brownsville (Tex.) BV Corpus Christi (Tex.) CC Galveston (Tex.) GV Port Arthur (Tex.) PA New Orleans (La.) NO Mobile (Ala.) MO Key West (Fla.) K F = Forecast for the coast of California south of San Francisco S = Bar. pressure, direction and force of wind, state of weather at San Pedro, San Francisco, and San Diego (state of the weather at San Pedro is omitted from 0430 bulletin), W = Storm warnings for the coast of California, south of San Francisco, and advices concerning storm warnings for the coast of California NOTE: The warnings are also transmitted on receipt
San Diego (California), NPL, 1,538 c.w.	0500 1630 2200 0600 1600 2000	0100 1300 — — — —	F.S.W. F.S.W. F.S.W. W. " "	— — — — — —	
Savannah (Ga.), NEV, 1,806 sp.	1600 — 1300 2300	— 1300 —	F.W. S. W.	p.l. " "	LOCAL BULLETIN. FW = Forecast and storm warnings for the coast of Georgia; advisory messages relating to storm warnings issued for the middle and south Atlantic and East Gulf Coasts S = Bar. pressure, wind force and directions, and state of weather at Savannah Storm warnings and advices as above NOTE: Hurricane warnings transmitted when necessary and repeated every 2 hours until 0500 G.M.T. Weather Bureau Station: Savannah, Ga.
St. Augustine (Fla.), NAP, 2,098 sp.	1630 — 1300 0200	— 1300 —	F.W. S. F.S.	p.l. " —	LOCAL BULLETIN. FW = Forecast and storm warnings for the east coast of Florida, from Jacksonville to Miami; advisory messages relating to warn- ings issued for the middle and south Atlantic and east Gulf Coasts S = Bar. pressure, direction and force of wind, and state of weather at Jacksonville and Titusville. Daily (except Sundays during the summer) NOTE: Hurricane warnings transmitted when necessary and repeated every 2 hours until 2300 G.M.T. Storm warnings and advices as above Weather Bureau Station: Jacksonville, Fla.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
UKRAINE					
Kharkov, RAJ, 3,500 sp. . .	1445	—	S.	—	Repeats the Kiev weather bulletin (see under Russia). If for any reason transmission is not made at 1445, the message will be sent at 2030
Sevastopol, RCT, 2,500 sp. . .	0600	(See notes)	S.	German met.	SYNOPTIC REPORTS. " RCT météo Sevastopol, followed by date " BBBDD FwTTT BBBDD FwTTT bbbRR NOTE : This message gives the weather at Sevastopol, the first two groups referring to observations made at 2100 local time of the preceding day ; the remaining groups to 0700 local time of the current day The 1200 bulletin consists of a collective report for the Black Sea and Sea of Azov. It commences " RCT Météo " followed by the date and the name of the observation station, the observations being of a similar character to those given in the 0600 bulletin. The state of the sea and information regarding ice conditions <i>en clair</i> are included at the end of each set of observations. Missing observations are shown by the letter (x) STATIONS : Sevastopol Yalta Taganrog Eupatoria Kertch Tuapse SOUTHERN EUROPE BULLETIN. RCT Bulletin of Southern Europe, day of month, day of week, name of ob. station, <i>en clair</i> BBBDD FwTTT bbbRR
	1200	—	S. I	"	
	1200	0600 0700 local time	S.	German met.	
URUGUAY					
Cerrito (Monte Video), CWA, 600 sp.	2200 see notes	See notes	S.	N.I.C.	The station sends out each day (Sundays excepted) between 2200 and 2300, a bulletin from the National Meteorological Institute containing the following information :— (a) The situation of the centres of atmospheric action in the southern part of the continent, <i>i.e.</i> , in the zone from latitude 22° to the extreme south. (b) The observations made at 1220 by the Central Observatory, Montevideo, and by the National Service stations. (c) The more important variations observed from 1220 to 2100.
VIRGIN ISLANDS					
St. Croix, NNI, 425 sp. . .	—	—	W.	p.l.	Hurricane warnings and advisory messages relating thereto are transmitted when issued by the San Juan Weather Bureau and repeated every 4 hours (see under Porto Rico)
St Thomas, NBB, 1,685 sp.	—	—	—	—	As above (St. Croix)
WINDWARD PASSAGE					
Navassa, WWEA, 600 sp. . .	request	—	S.	p.l.	Barometer readings, corrected to sea level, supplied on request

(2) TIME SIGNALS

RHYTHMIC (OR VERNIER) SIGNALS.

(1) These signals are intended for accurate geodesical work in determining the difference of longitude and for "rating" chronometers. They are transmitted direct from the standard astronomical clock in sidereal time units.

2) Procedure :

The signals will consist of the transmission of a series of 300 dots (representing the beats of a standard astronomical clock), except that Nos. 60 and 61, 120 and 121, 180 and 181, and 240 and 241 are omitted, being replaced by a dash of nearly one second's duration, or the equivalent of two beats (or dots). The interval between successive dots represents one beat of the clock adjusted to beat 50 times in 49 sidereal seconds. Each series is sent by the following method :—

The times refer to Paris signals

(G.M.T. approx).

h. m. s. h. m. s.

$\left. \begin{matrix} 9 \\ 21 \end{matrix} \right\} 58 \quad 00$

A series of trial or regulation dots • • • • •
• • • • • etc., for nearly one minute, controlled by the standard clock.

$\left. \begin{matrix} 9 \\ 21 \end{matrix} \right\} 59 \quad 00$

Repetitions of — • — • — followed by the call signal of the transmitting station.

$\left. \begin{matrix} 9 \\ 21 \end{matrix} \right\} 59 \quad 50$

(— • • • —) followed by a silent interval.

$\left. \begin{matrix} 10 \\ 22 \end{matrix} \right\} 00 \quad 00 \text{ to } \left. \begin{matrix} 10 \\ 22 \end{matrix} \right\} 05 \quad 00$

Series of 300 equidistant signals, given by the clock :—Beats Nos. 1, 2, 3, etc., to 59.

Dash (—) of one second's duration, nearly, equal to the interval of two consecutive beats, its commencement coinciding with the beginning of No. 60 and the finish with the end of No. 61.

Beats Nos. 62, 63, 64, etc., to 119.

Dash (—) of one second's duration nearly, as before, its commencement coinciding with the beginning of No. 120 and the finish with the end of No. 121.

Beats Nos. 122, 123, etc., to 179, and so on until No. 300 (Nos. 180 and 181, and 240 and 241 being given as a dash).

The interval between each dot (or beat) = $\frac{49}{50}$ sec.
Sidereal Time (which is equal to $\frac{41}{5}$ sec. Mean Time, nearly).

(3) Corrections:

The *exact* times of transmitting the first and last dots are sent later the same day (see Tables for times) by the following method :—

(G.M.T. approx.) :

h. m. s.

10 }
22 } 38 00

Repetitions of — ● — ● — followed by the call signal “ Temps sidéral ” — ● ● ● — followed immediately by two groups of eight figures: the first giving the sidereal time (extrapolation) of the first signal, and the second that of the last signal (300). Both groups are transmitted three times each, thus :—

“ Temps Sideral.”

— ● ● ● —
— ● ● ● —
— ● ● ● —

10305622 } (= 10h. 30m. 56.22s.
10305622 } Greenwich
10305622 } Sidereal Time.)

10354940 } (= 10h. 35m. 49.40s.
10354940 } Greenwich
10354940 } Sidereal Time.)

10 }
22 } 43 00

● — ● ● ●

		h.	m.	s.
Signalled time of last dot	=	10	35	49.40
Signalled time of first dot	=	10	30	56.22

Tune of whole series	=	0	4	53.18
	=	293.18 sec. (sidereal)		
Average interval between dots	=	293.18		
		299		
	=	.9805 sec. (sidereal).		

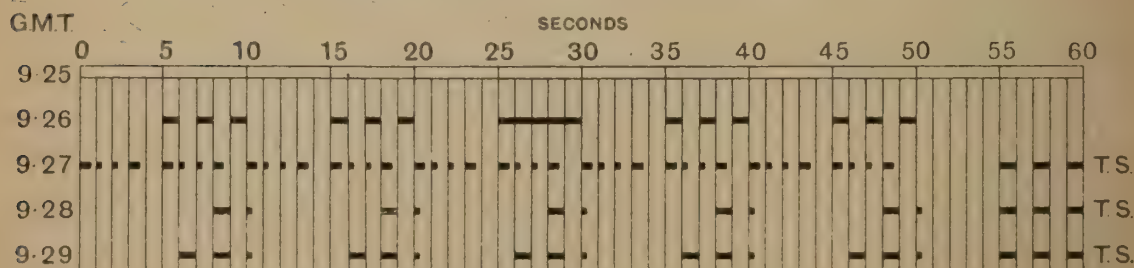
These times can be converted to Greenwich Mean Time, by making use of tables given in the “ Nautical Almanac.”

ORDINARY TIME SIGNALS.

These time signals require small corrections inasmuch as they are necessarily based on the extrapolated time. The corrections for each day are subsequently published by the Bureau International de l'Heure.

CHART A.

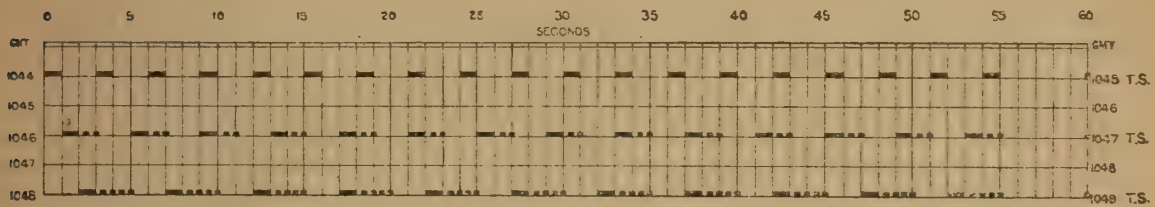
INTERNATIONAL TIME SIGNALS.



The first line of signals is only a call and varies with different stations.

CHART B.

PARIS SEMI-AUTOMATIC TIME SIGNALS—ORDINARY.



These signals are also transmitted from 2244 2248. (Dots of $\frac{1}{4}$ sec. duration ; the beginning of the signal is the time.)

CHART C.

AMERICAN SYSTEM.

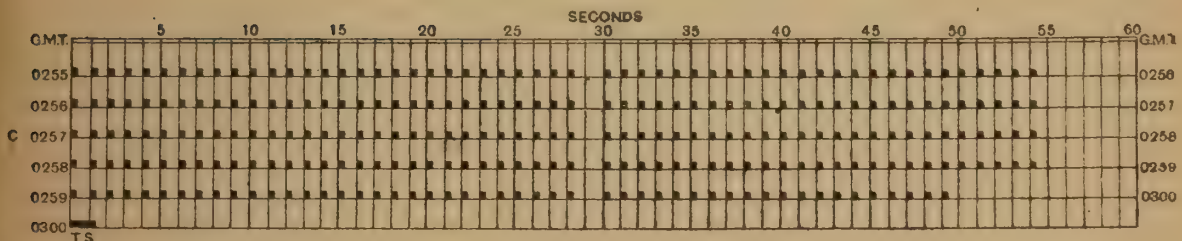
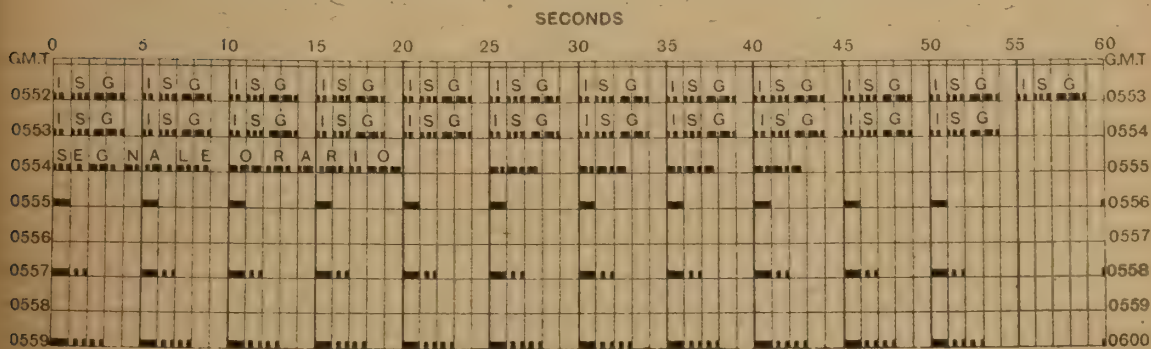


CHART D.

ITALIAN SOMALILAND, MOGADISCIO ISG.



TIME SIGNALS TRANSMITTED FROM VARIOUS COUNTRIES

Note.—The geographical positions given underneath stations are in most cases the latitude and longitude of observatories and not the transmitting stations. G.M.T. is reckoned from midnight.

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
ARGENTINE				
Buenos Aires—	LIH	1,000	h. m. s. h. m. s.	— — — — — etc.
Lat. 34° 35' 40" S.			01 55 00-01 55 50	• (T.S.)
Long. 58° 22' 07" W.			01 56 00	— — — — — etc.
			01 56 15-01 56 50	• (T.S.)
			01 57 00	— — — — — etc.
			01 57 20-01 57 50	• (T.S.)
			01 58 00	— — — — — etc.
			01 58 25-01 58 50	• (T.S.)
			01 59 00	— — — — — etc.
			01 59 30-01 59 50	• (T.S.)
			02 00 00	NOTES: (1) Daily except Sundays and public holidays
AUSTRALIAN COMMONWEALTH				
Adelaide—	VIA	600 sp.	0027-0030 1227-1230	International International (controlled by Adelaide Ob.)
Lat. 34° 55' 38" S.				
Long. 138° 34' 59" E.	VIM	600 c.w.	0157-0200 1357-1400	International International (controlled by Melbourne Ob.)
Melbourne—				
Lat. 37° 49' 53" S.	VIP	600 sp.	0057-0100 1257-1300	International International (controlled by Melbourne Ob.)
Long. 144° 58' 33" E.				
Perth—	VIS	600 c.w.	1055-1100 0255-0300	Dashes at 05-25, 105-115, 205-305-315, 405-415, 505-515, in minute, and a dot at every 0.2 second Automatic transmission from Sydney Ob. Sundays excluded.
Lat. 31° 51' 07" S.				
Long. 115° 50' 26" E.				
Sydney—				
Lat. 33° 51' 41" S.				
Long. 151° 12' 23" E.				
BRAZIL				
Rio de Janeiro (Ilha de Governador)	SOH	1,800	1357-1400 2357-2400	International International
Lat. 22° 48' 00" S.				NOTE: Signals sent 30 mins. in case of accident, preventing transmission at correct times—the word "correção" preceding such signals
Long. 43° 13' 00" W.				
BRITISH INDIA				
Calcutta—	VWC	2,000	0727-0730 1627-1630	International International
Lat. 22° 33' 31" N.				NOTES: (1) Preliminary signals two minutes before transmission T.S. proper, call —●—●—●— repeated three times "ordinary signals," "wait" (●—●—●—); these signals are sent by hand.
Long. 88° 20' 16" E.				(2) Signals automatically controlled from Alipore Ob., Calcutta.
				(3) T.S. accurate to within 0.2
				(4) Should there be any inaccuracy the T.S. is followed by the "error" signal and the words "signal failed"
Peshawar—	VWP	1,800 sp.	0530	
Lat. 34° 02' 00" N.				
Long. 71° 40' 00" E.				
CANADA				
Camperdown (Halifax)—	VCS	600 sp.	13 58 00-13 58 57 13 59 00 13 59 02-13 59 50 14 00 00	A dot at each second • (T.S.) A dot at each second • (T.S.) Daily except Sundays
Lat. 44° 31' 10" N.				
Long. 62° 32' 40" W.				

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
ERITREA				
Massawa— Lat. 15° 37' 24" N. Long. 39° 28' 41" E.	ICX	3,500 sp. 9,400 c.w.	0456 0458 0500 0956 0958 1000	Same code as for Italian Somaliland Mogadiscio (q.v.) do. do. do. do.
FRANCE				
Eiffel Tower— Lat. 48° 51' 11" N. Long. 2° 20' 14" E.	FL	2,600 sp.	0927-0930 1000-1005 1038/1043 1045-1049 2200-2205 2238-2243 2244-2249	International Scientific signals (rhythmic beats) Groups for correcting rhythmic beats Old French system (semi-automatic) Scientific signals (rhythmic beats) Groups for correcting rhythmic beats Old French system (semi-automatic) Scientific signals (rhythmic beats) Groups for correcting rhythmic beats Old French system* (semi-automatic)
Lyons— Lat. 45° 41' 41" N. Long. 4° 47' 08" E.	YN	15,500 c.w.	0820-0825 0850-0857 0900-0904	*The preparative signals are sent by hand and the T.S. proper are automatically operated from Paris observatory.
Bordeaux (Lafayette)— Lat. 44° 50' 07" N. Long. 0° 31' 23" W.	LY	18,900 c.w.	0757-0800 0810-0815 2000-2005 (see notes) 2115-2120	International (by land line from Paris) Scientific signals (rhythmic beats by land line from Paris), preceded by corrections for previous day's signals Scientific signals (rhythmic beats) Groups for correcting rhythmic beats of the same day These signals are sometimes delayed on account of being preceded by URSI signals (q.v.), as the URSI signals are not always concluded at the anticipated time. The delay, thus occasioned may amount to as much as 30 minutes
FRENCH-INDO CHINA				
Kien-Au— Lat. 20° 48' 00" N. Long. 106° 37' 00" E.	HVB	1,200	0215 0217 0 219	— — — — — — • • — • • • • (NOTE: These signals are not of high accuracy.)
Saigon— Lat. 10° 47' 00" N. Long. 106° 42' 00" E.	HZA	20,800 c.w.	2130-2135	Scientific signals in same code as Eiffel Tower rhythmic signals.

NOTE.—Prior to the above signals being transmitted, Saigon W.T station will transmit the times of the first and 300th dots of the signals sent out two days before, the procedure being as follows:—

G.M.T.

h.	m.	s.	
21	20	00	Repetitions of — • • • • — HZA.
21	21	00	" Temps sidéral " followed by the date of the signals affected.
21	21	50	Break sign (— • • • • —).
21	22	00	Group of eight figures giving the time of the first dot.
21	22	30	Period (• • • • •).
21	23	00	Group of eight figures giving the time of the 300th dot.
21	23	30	Break sign (— • • • • —).
21	23	40	Two repetitions of the signals made between 21h. 22m. 00s. and 21h. 23m. 30s. (The transmission of the figures is made slowly).

In case the signals emitted two days previously by HZA have failed to be observed by the Bureau International de l'Heure, the following message, repeated three times, will be sent out by HZA at 21h. 20m. 00s. instead of those mentioned above:—

" Temps sidéral (followed by the date of the time signals concerned) — • • • • — N'a pu être déterminé (cannot be determined)."

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
GERMANY				
Nauen— Lat. 52° 39' 01" N. Long. 12° 54' 33" E.	POZ	18,050 c.w. 3,100 sp. (together)	1157-1200 2357-2400 0002 and 1202 approx. (see notes)	International International NOTES: (1) In the event of any inaccuracy in these signals the "erase" signal of 8 dots, repeated twice, will be sent immediately after the message. (2) Preparatory signals POZ (station call) and MGZ (meaning G.M.T.) Scientific or Vernier signals (Rhythmic beats) Scientific or vernier time signals are transmitted shortly after the ordinary time signals at 0000 and 1200 G.M.T.

These consist of the transmission of a series of 301 signals (i.e., Nos. 1 to 301), which are represented by dots, with the exception of Nos. 1, 61, 121, 181, 241 and 301, which are sent as dashes. The latter are of $\frac{1}{4}$ a second's duration.

The interval between any two signals = 0.977 sec. (approx.)

The first signal of the series is transmitted at:—

h.	m.	s.		h.	m.	s.
0	00	59.4	G.M.T.	0	05	52.5
12				12		

and the last at:—

From these times the exact moment of any coincidence which occurs between the beat of the observer's chronometer and the signals automatically transmitted by the standard clock can be accurately computed to .01 second.

Where the greatest possible accuracy is desired the publications of the German Sea Observatory should be consulted, in which the exact times of each series of signals will be periodically given.

See also under Introduction to Time Signals, page 704.

GREECE				
Athens— Lat. 37° 58' 20" N. Long. 23° 43' 14" E.	SXA	1,200 sp.	2157-2200	International
HAWAIIAN ISLANDS				
Pearl Harbour (Honolulu)— Lat. 21° 20' 45" N. Long. 157° 57' 56" W.	NPM	2,255 sp. 11,490 c.w.	2355-2400	American Code. Accurate to 0.2 sec. with San Francisco Naval Ob. Time
HONG-KONG				
Stonecutters— Lat. 22° 19' 21" N. Long. 114° 08' 43" E.	BXY	2,000 i.c.w.	0156-0200 1255-1300	International Preliminary signals sent 2 mins. before transmission of T.S. proper—CQ de BXYHK "Time Wait." The T.S. are dots (0.2 sec. duration) sent at the even seconds from 1255-1300 G.M.T. The dots are omitted at the 28th, 29th, 54th, 55th, 56th, 57th, 58th and 59th sec. of each minute for the purpose of identifying the signals. NOTE: Controlled from Hong Kong ob.
ITALIAN SOMALILAND				
Mogadiscio— Lat. 02° 02' 13" N. Long. 45° 21' 14" E.	ISG	2,850	0600	See chart. NOTES: All preliminary signals are made by hand. The T.S. proper are of 0.20 sec. duration and are transmitted automatically by a pendulum. The error and rate are obtained astronomically by a transit instrument set up at the station. T.S. sent daily

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
JAPAN				
Funabashi— Lat. 35° 42' 00" N. Long. 139° 59' 00" E.	JJC	4,000 sp.	<div>h. m. s. h. m. s.</div> <div>11 59 00-11 59 55</div> <div>12 00 00-12 00 01</div> <div>12 00 30-12 00 55</div> <div>12 01 00-12 01 01</div> <div>12 01 30-12 01 55</div> <div>12 02 00-12 02 01</div> <div>12 02 30-12 02 55</div> <div>12 03 00-12 03 01</div> <div>12 03 30-12 03 55</div> <div>12 04 00-12 04 01</div>	<div>----- etc.</div> <div>— (T.S.)</div> <div>— • • • • • etc.</div> <div>— (T.S.)</div> <div>— • • • • • etc.</div> <div>— (T.S.)</div> <div>— • • • • • etc.</div> <div>etc.</div> <div>— (T.S.)</div> <div>— • • • • • etc.</div> <div>etc.</div> <div>— (T.S.)</div>
			1400	NOTE: The beginning of the dash at each minute is the T.S. Rhythmic signals (300 dots) during summer months only—Sundays excepted. Same code as for Funabashi above NOTE: T.S. controlled from Tokyo Ob. Daily except Sundays.
Chosi— Lat. 35° 40' 21" N. Long. 139° 32' 31" E.	JCS	600 sp.	1159-1204	
MAURITIUS				
Mauritius	—	—	—	No arrangements exist for the issue of time signals or weather reports but the Government are considering the possibility of connecting the W T station at Mauritius (BZG) with the ob.
MESOPOTAMIA				
Basra—	VTC	600 sp.	<div>10 57 42</div> <div>10 58 42-10 59 42</div> <div>10 59 57-11 00 00</div>	<div>CQ de VTC (sent twice). Time signal 1100 G.M.T. (sent twice)</div> <div>— • • • • • etc.</div> <div>— (of 3 secs. duration). End of dash is T.S.</div>
MEXICO				
Chapultepec (Mexico City)— Lat. 19° 24' 18" N. Long. 99° 11' 40" W.	XDA	5,800	0055-0100 1855-1900	<div>American code</div> <div>American code</div> <div>NOTE: Signals controlled by Tacubaya ob.</div> <div>Daily except Sundays and public holidays, when the 1900 signal only is sent</div>
NEW ZEALAND				
Wellington— Lat. 41° 17' 04" S. Long. 174° 46' 04" E.	VLV	600 sp.	<div>h. m. s. h. m. s.</div> <div>22 58 00-22 59 05</div> <div>22 59 10-22 59 50</div> <div>23 00 00-23 00 01</div> <div>23 00 12-23 00 50</div> <div>23 01 00-23 01 01</div> <div>23 01 13-23 01 50</div> <div>23 02 00-23 02 01</div> <div>23 02 14-23 03 50</div> <div>23 04 00-23 04 01</div> <div>23 04 09-23 04 50</div> <div>23 05 00-23 05 01</div>	<div>(1) DAYLIGHT TIME SIGNALS.</div> <div>VLV VLV VLV etc.</div> <div>— • • • • • etc.</div> <div>(Hand signals)</div> <div>— (T.S.)</div> <div>— • • • • • etc. (Hand signals)</div> <div>— (T.S.)</div> <div>— • • • • • etc. (Hand signals)</div> <div>— (T.S.)</div> <div>— • • • • • etc. (Hand signals)</div> <div>etc. (Hand signals)</div> <div>— (T.S.)</div> <div>— • • • • • etc. (Hand signals)</div> <div>— (T.S.)</div>
				<div>NOTES: (1) The Daylight Time Signals are sent every day except Saturdays, Greenwich date (=Sundays, New Zealand date), and New Zealand Government holidays</div> <div>(2) Each signal commences exactly at the beginning of the minute and lasts for one second approx. There is no T.S. at 23h. 03m. 00s.</div> <div>(3) Signals controlled from the Hector Ob. (Wellington)</div> <div>(2) NIGHT TIME SIGNALS.</div>

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.																																																																						
NEW ZEALAND—contd.			0900-0905	Exactly as for Daylight Signals (above) NOTES: (1) These T.S. are transmitted on Mondays and Thursdays, Greenwich date (=Tuesday and Friday evenings, New Zealand date), except on New Zealand Government holidays (2) The first T.S. is at 09h. 00m. 00s. (G.M.T.), and is repeated at the 1st 2nd, 4th and 5th minutes. There is no T.S. at 09h. 03m. 00s. (3) N.Z.M.T. is 11½ hrs. ahead of G.M.T. (4) The signals, other than the actual T.S. are transmitted by hand																																																																						
PANAMA																																																																										
Colon— Lat. 9° 21' 56" N. Long. 79° 54' 01" W.	NAX	1,817 sp.	0955-1000 1755-1800	American code American code Daily. Maximum error not more than 0.5 sec.; usual error not more than 0.1 sec.																																																																						
Balbao— Lat. 8° 56' 34" N. Long. 79° 33' 20" W.	NBA	6,663 c.w.	0955-0600 1755-1800	American Code American Code Daily																																																																						
PHILIPPINE ISLANDS																																																																										
Cavite— Lat. 14° 29' 01" N. Long. 120° 54' 43" E.	NPO	2,701 sp. 5,260 c.w. together	0255-0300 1355-1400	American Code American Code NOTE.—Signals controlled from Manila Ob. by land line Daily. Sundays and holidays included.																																																																						
PORTUGUESE EAST AFRICA																																																																										
Lourenço Marques— Lat. 25° 58' 05" S. Long. 32° 35' 39" W.	CRZ	600 sp.	0757-0800 1857-1900	International. International. NOTES: (1) Signals controlled by Campos Rodrigues Ob. (2) Measured lag of 0.02 sec. allowed for in transmission.																																																																						
RUSSIA																																																																										
Detskoye Selo (near Leningrad) Lat. 59° 46' 18.7" N. Long. 30° 19' 38.6" E.	RET	7,100 c.w.	<table><tr><td>h. m. s.</td><td>h. m. s.</td></tr><tr><td>18 55 00-18 56 00</td><td></td></tr><tr><td>18 56 00-18 57 00</td><td></td></tr><tr><td>18 57 20-18 57 50</td><td></td></tr><tr><td>18 58 00-18 58 05</td><td></td></tr><tr><td>18 58 20-18 58 50</td><td></td></tr><tr><td>18 59 00-18 59 05</td><td></td></tr><tr><td>18 59 20-18 59 50</td><td></td></tr><tr><td>19 00 00-19 00 05</td><td></td></tr><tr><td>19 00 20-19 01 20</td><td></td></tr></table>	h. m. s.	h. m. s.	18 55 00-18 56 00		18 56 00-18 57 00		18 57 20-18 57 50		18 58 00-18 58 05		18 58 20-18 58 50		18 59 00-18 59 05		18 59 20-18 59 50		19 00 00-19 00 05		19 00 20-19 01 20		<table><tr><td colspan="5">ORDINARY TIME SIGNALS.</td></tr><tr><td>• • • • •</td><td>• • • • •</td><td>• • • • •</td><td>• • • • •</td><td>etc.</td></tr><tr><td>• — — — •</td><td>• — — — •</td><td>• — — — •</td><td>• — — — •</td><td>etc.</td></tr><tr><td>— — — — —</td><td>— — — — —</td><td>— — — — —</td><td>— — — — —</td><td>etc.</td></tr><tr><td>0 1</td><td>2 3</td><td>4 5</td><td></td><td>(T.S.)</td></tr><tr><td>— — — — —</td><td>— — — — —</td><td>— — — — —</td><td>— — — — —</td><td>etc.</td></tr><tr><td>0 1</td><td>2 3</td><td>4 5</td><td></td><td>(T.S.)</td></tr><tr><td>— — — — —</td><td>— — — — —</td><td>— — — — —</td><td>— — — — —</td><td>etc.</td></tr><tr><td>0 1</td><td>2 3</td><td>4 5</td><td></td><td>(T.S.)</td></tr><tr><td>— — — — —</td><td>— — — — —</td><td>— — — — —</td><td>— — — — —</td><td>etc.</td></tr></table> <p>Figure signals (consisting of 3 figures) sent 4 times (error of time signal in sec. and tenths of sec.).</p> <p>NOTE.—Connected by land-line with Pulkovo Ob.</p>	ORDINARY TIME SIGNALS.					• • • • •	• • • • •	• • • • •	• • • • •	etc.	• — — — •	• — — — •	• — — — •	• — — — •	etc.	— — — — —	— — — — —	— — — — —	— — — — —	etc.	0 1	2 3	4 5		(T.S.)	— — — — —	— — — — —	— — — — —	— — — — —	etc.	0 1	2 3	4 5		(T.S.)	— — — — —	— — — — —	— — — — —	— — — — —	etc.	0 1	2 3	4 5		(T.S.)	— — — — —	— — — — —	— — — — —	— — — — —	etc.
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0 1	2 3	4 5		(T.S.)																																																																						
— — — — —	— — — — —	— — — — —	— — — — —	etc.																																																																						

The commencement of the dash is the time signal.

The first signal of the third series, transmitted exactly at 19h. 00m. 00s. G.M.T., will be considered to be the standard signal. Since all the time signals have the same error, only the error of the standard signal will be transmitted from 19h. 00m. 20s. to 19h. 01m. 20s. If the correct time at the moment of transmission is 19h. 00m. 00.2s. (i.e., if the standard clock is 00.2 sec. slow), there will be transmitted the figures 02 sent four times. If, on the other hand, the standard clock is 00.6 sec. fast, making the exact time 18h. 59m. 59.4s. the error will be represented by the figures 594 sent four times.

Standard Time is 2 hours fast on G.M.T.

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
RUSSIA—contd.			h. m. s. h. m. s.	SCIENTIFIC SIGNALS (RHYTHMICS) ● ● ● ● ● etc., preparative 12 series of 31 dots, each series being separated by an interval of 10 secs. ● ● ● — — (Final signal) NOTE: The clock signals are dots with an interval of 0.07050 secs.
			19 01 45-19 02 00	
			19 02 15-19 09 55	
			19 10 00	

Should there be any irregularity in the transmission, the "break" sign (— • • • —) will be transmitted several times, indicating the impossibility of continuing the signals.

To determine the exact error of the chronometer, it is necessary to use the circulars of the Central Russian Astronomical Observatory, Pulkowa, which give the errors of the time at which the first and last rhythmic signals were sent for each day.

Moscow (Oktyabrskaya) Lat. 55° 46' 18.7" N. Long. 30° 19' 38.6" E.	RAI	4,880 sp.	<div>h. m. s. h. m. s.</div> <div>20 55 00-20 56 00</div> <div>20 56 00-20 57 00</div> <div>20 57 20-21 01 20</div>	<div>ORDINARY TIME SIGNALS.</div> <div>• • • — • • • — etc.</div> <div>— • • — • • • — etc.</div> <div>As for Detskoje Selo (above)</div> <div>NOTE.—Connected with the Pulkovo Ob. by landline.</div> <div>SCIENTIFIC SIGNALS (RHYTHMICS)</div> <div>• • • • • etc., preparative</div> <div>12 series of 31 dots each series being separated by an interval of 10 secs.</div> <div>• • • — — — (Final signal)</div> <div>NOTE.—The clock signals are dots separated by intervals of 0.97959 secs.</div> <div>See also Detskoje Selo (above)</div> <div>— • • • — (attention)</div> <div>— • • — — — (RQA)</div> <div>— • • — — —</div> <div>— every 5 secs.</div> <div>— — — — — one long 5 sec. dash (T.S.)</div> <div>— — — — — every 5 secs.</div> <div>— — — — — one long 5 sec. dash (T.S.)</div> <div>— — — — — every 5 secs.</div> <div>— — — — — one long 5 sec. dash (T.S.)</div> <div>Time signals are sent daily for the benefit of Russian Northern W.T. stations. As the signals are made by hand, errors up to 5 secs. may result. The end of the long dash is the T.S.</div>
			<div>21 02 00-21 02 15</div> <div>21 02 30-21 10 10</div> <div>21 10 30</div>	
Archangel— Lat. 64° 27' 00" N. Long. 40° 39' 00" E.	RQA	600 sp.	<div>00 52 00-00 55 45</div> <div>00 56 00-00 57 00</div> <div>00 57 10-00 57 45</div> <div>00 57 55-00 58 00</div> <div>00 58 10-00 58 45</div> <div>00 58 55-00 59 00</div> <div>00 59 10-00 59 45</div> <div>00 59 55-01 00 00</div>	

SARAWAK

Kuching— Lat. 1° 13' 19" N. Long. 110° 10' 50" W.	VQF	1,700 sp.	00 38 37	The time signal is given at 8h. oom. 00 s. Local time by the word "TIME," the dash T indicating the hour.

SOUTH AFRICA

Cape Town— Lat. 33° 56' 3.5" S. Long. 18° 19' 17.8" E.	VNC	600 sp.	20 59 30-21 00 00	<div>Warning Signal commences at 2055</div> <div>A series of 12 dashes, each of about ¾ sec. duration, extending over half a minute and divided up into five groups; a dash commencing at each of the following times:—</div> <div><div><div>h. m. s.</div><div>20 59 30</div><div>32 I</div><div>34</div><div>20 59 38</div><div>40 II</div><div>20 59 44</div><div>III</div></div><div><div>h. m. s.</div><div>20 59 48</div><div>50 IV</div><div>20 59 54</div><div>56 V</div><div>58</div><div>21 00 00</div></div></div> <div>NOTE.—Each signal may be used as indicating the exact G.M.T. recorded above; the beginning of the last dash of the series is exactly 21h. oom. 00 s. G.M.T. Signals sent daily controlled from Royal Observatory, Cape.</div>

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
U.S.A.				<i>All American Time Signals are sent according to the American Code.</i>
Annapolis— Lat. 38° 59' 00" N. Long. 76° 27' 00" W.	NSS	17,150 c.w.	0255-0300 1655-1700	Signals sent daily: The "lag" of the Annapolis T.S. is 0.08 sec. (constant)
§Boston (Mass)	NAD	1,363 c.w.	1655-1700	
§Charleston (Sc.)	NAO	2,600 c.w.	1655-1700	
Eureka— Lat. 40° 41' 22" N. Long. 124° 16' 10" W.	NPW	3,156 c.w.	1955-2000	Daily, except Sundays and holidays. Controlled by Naval Ob., Washington.
Great Lakes— Lat. 42° 18' 30" N. Long. 87° 50' 00" W.	NAJ	1,986 c.w.	1655-1700	Daily, except Sundays and Holiday Controlled by Naval Ob., Washington
Key West— Lat. 24° 33' 28" N. Long. 81° 48' 26" W.	NAR	1,463 c.w.	1655-1700	Daily, except Sundays and holidays Controlled by Naval Ob., Washington The "lag" of the Key West T.S. is 0.28 sec.
New Orleans— Lat. 29° 56' 50" N. Long. 90° 02' 18" W.	NAT	2,600 c.w.	1655-1700	Daily.
§New York	NAH	1,538 c.w.	1655-1700	
§Newport (R.I.)	NAF	2,600 c.w.	1655-1700	
§Norfolk (Va.)	NAM	1,363 sp.	1655-1700	
North Head— Lat. 46° 17' 56" N. Long. 124° 04' 31" W.	NPE	2,726 sp.	1955-2000	Daily, except Sundays and holidays Controlled by Naval Ob., Washington.
San Diego— Lat. 32° 42' 26" N. Long. 117° 14' 49" W.	NPL	1,538 c.w. 9,798 c.w.	1955-2000	Daily. Controlled by Naval Ob. Mare Island
San Francisco— Lat. 37° 39' 18" N. Long. 122° 22' 52" W.	NPG	4,836 c.w. 1,333 c.w.	0555-0600 1955-2000	Daily. Controlled by Naval Ob. Mare Island.
Washington (Arlington)— Lat. 38° 52' 05" N. Long. 77° 44' 47" W.	NAA	2,655 c.w.	0255-0300 1655-1700	Daily. Controlled by Naval Ob. Washington The "lag" of the Arlington T.S. is 0.09 sec. (constant). Error generally less than 0.1 sec. These stations § transmit when Washington NAA is out of action.

(3)—HYDROGRAPHIC SECTION.

(See also General Section under Distress Signals.)

Regulations for the Safety of Navigation.

SAFETY SIGNAL.—The radiotelegraph stations which have to transmit to ships information involving safety of navigation and being of an urgent character (icebergs, derelicts, cyclones, typhoons, sudden changes in the position or form of fixed obstructions or of land marks) shall make use of the following signal, called the safety signal, repeated at short intervals ten times at full power : — — — (T T T). In principle, all radiotelegraph stations receiving the safety signal shall, if the transmission of messages by them would interfere with the receipt by any other station of the safety signal and the following safety message, keep silence, in order to allow all interested stations to receive that message. This does not apply to cases of distress. The safety message shall be transmitted one minute after the safety signal has been sent out, and shall be repeated thereafter three times at intervals of ten minutes. The Governments of the Contracting States will select the stations which are to send out to mariners safety information of an urgent character. When the information in question has been sent out by stations performing the time service it shall be again sent out after the transmission of the time signal and the weather report.

Each country scheduled below makes provision only for the broadcasting of warnings which relate to navigational aids and dangers coming under its own jurisdiction.

Derelicts, wrecks and mines are reported as considered desirable.

All messages are transmitted immediately upon receipt at W/T Station and at certain specified times to be found below or in some cases on request by shipping.

INTERNATIONAL ICE CODE.

Ice warnings are transmitted according to the following code :—

JK	JK	JK	JK	JK	JK	JK	JK	JK	etc.
1	2	3	4	5	6	7	8	9	
1st group.			2nd group.			3rd group.			

J = Ice Conditions.

K = Effect on Navigation.

0	Open water.	0	Conditions not known owing to fog, snow, etc.
1	Thin loose ice.	1	Navigation practicable.
2	Drift ice.	2	Navigation difficult for sailing vessels.
3	Thin covering of ice.	3	Navigation difficult but practicable for sailing vessels assisted by tugs.
4	Close pack ice.	4	Navigation very difficult; closed to sailing vessels.
5	Difficult drift ice.	5	Navigation only practicable for large steamers.
6	Thick covering of ice.	8	Navigation only practicable with the assistance of ice breakers.
7	Heavy drift ice.	7	Navigation closed.
8	Heavy masses of ice.	8	Navigation channel kept open by ice breakers.
9	Not known.	9	Not known.

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
ALASKA Dutch Harbour, NPR, 2,255 sp.	0530* 0930*	—	Naval W/T stations will furnish this information to passing vessels whenever practicable on request
ALGERIA Oran, FUK, 600 sp. 1,350 .. Fort de l'Eau, FFA, 600 sp. ..	1800 request request	Western Mediterranean .. —	The warning will be repeated daily for a week if necessary See under France for regulations
ARGENTINE Buenos Ayres (Darsena Norte), LIH 1,000 sp	0200*	Navigation warnings are broadcast <i>en clair</i> in Spanish and English, consecutively. The message is repeated after an interval of one minute There are two classes of messages which will contain the following information :— (1) Important alterations to aids to navigation such as lights, buoys and beacons; positions of derelicts and obstructions; location of ice. (2) Establishment of new lights, buoys, beacons, etc., or alterations to existing navigational aids, which information cannot be notified sufficiently in advance by a Notice to Mariners; If necessary the messages are repeated daily for a period of ten days Navigation warnings are broadcast as soon as Buenos Ayres (Darsena Norte) W/T station has finished transmission The regulations are the same as for Darsena Norte (q.v.)	
AUSTRALIAN COMMON-WEALTH Perth, VIP Brisbane, VIB Sydney, VIS Melbourne, VIM Adelaide, VIA Broome, VIO Darwin, VID Thursday Is., VII Townsville, VIT Hobart (Tasmania), VIH All 600 sp.	1300* 1200* 1030* 2230* 1100* 1130* request request request request request	Western Australian waters Queensland waters East Coast Victorian and Tasmanian waters South Australian waters Local	— — — — —

NOTICE TO SHIPMASTERS.

The British "Marine Observer" and the American Hydrographic Office Pilot Charts may be inspected and observers' forms may be obtained at the offices of the Deputy Directors of Navigation in Fremantle, Adelaide, Melbourne, Sydney, Brisbane, and Hobart.

The Deputy Directors will also furnish any navigational information relating to Australian waters, and advise shipmasters on maritime subjects.

(1)	(2)	(3)	(4)
BELGIUM Ostende, OST, 600 sp. ..	0900 1800 2200	—	Broadcasts warnings concerning the extinguishing of lights on buoys and light vessels, buoys and light vessels adrift; wrecks dangerous to navigation. etc. Do. do.
Anvers (Antwerp), OSA, 600 sp.	0700 1500	—	
West Hinder Light Vessel, OTW, 600 sp.	—	—	Transmits messages to ships relating to accidents and difficulties of navigation. These messages are sent free of charge. Hours of service: From 0400 to 0420 and the first 20 mins. of each hour from 0800-2020 G.M.T.
BERMUDA ISLAND Bermuda Dock Yard, BZB, 1,600 for (a), 600 for (b)	(a) 0015 1215 (b) 0020 1220	—	Information concerning dangers to shipping or other important Hydro. information are broadcast when necessary immediately after the weather report
BRITISH INDIA Karachi, VWK, 2,000 sp. ..	0830† 1630†	—	The warnings are broadcast as soon as possible after receipt on 600 metres sp., and then at times stated, and on wavelengths given for five successive days, and will be continued if necessary <i>En clair</i> messages (English) do. do. do. do.
Bombay, VWB 2,000 sp. ..	0900† 1700†	—	
Madras, VWM, 600 sp. ..	1900† 1700†	—	do. do. do. do.

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(3)	(3)	(4)
Calcutta, VWC, 2,000 sp. . .	0830† 1630†	-----	The warnings are broadcast as soon as possible after receipt on 600 metres sp., and then at times stated, and on wavelengths given for five successive days, and will be continued if necessary. <i>En clair</i> messages (English)
Rangoon (Burma), VTR, 1,200 sp.	0900† 1700†	-----	
Port Blair (Andaman Is.), VTP, 1,200 sp.	0830 1630	-----	
CANADA (including British Columbia and Newfoundland)			
Pacific Coast			
Digby Is., B.C. VAJ	request	Local and general	Information re dangers to navigation
Dead Tree Point, B.C. VAH	request	do. do.	do: do. do. do.
Bull Harbour, B.C. VAG	request	do. do.	do. do. do. do.
Alert Bay, B.C. VAF	request	do. do.	do. do. do. do.
Cape Lazo, B.C. VAC	request	do. do.	do. do. do. do.
Estevan, B.C. VAE	request	do. do.	do. do. do. do.
Point Grey, B.C. VAB	request	do. do.	do. do. do. do.
Pachena, B.C. VAD	request	do. do.	do. do. do. do.
Gonzales Hill (Victoria), B.C. VAK	request	do. do.	do. do. do. do.
(All 600 m. spk., except Pachena 800 m.)			
Atlantic Coast, The Gulf and River St. Lawrence up to Montreal			
Cape Sable, N.S. VCU	0200† 1400†	(1) Bay of Fundy (2) Nova Scotia and Newfoundland coasts (3) North Atlantic	(1) Ice reports (2) Reports respecting dangers to navigation
Cape Race, Nfld. VCE	0215† 1415†	do. do.	do. do. do. do.
Belle Isle, Nfld. VCM	0230† 1430†	Gulf of St. Lawrence and Straits of Belle Isle	do. do. do. do.
Fame Point, P.Q. VCG	0145† 1345†	do. do. do.	do. do. do. do.
Father Point, P.Q. VCF	0200 1400	River and Gulf of St. Lawrence	Reports respecting dangers to navigation
Quebec, P.Q. VCC	0130 1330	River St. Lawrence	do. do. do. do.
Camperdown, N.S. VCS	request	(1) Bay of Fundy (2) North Atlantic (3) Nova Scotia Coast	do. do. do. do.
North Sydney, N.S. VCO	request	(1) Gulf of St. Lawrence (2) North Atlantic, Nova Scotia and Nfld. coasts	The ice-report will include a message embodying ice conditions from Cape Race to Quebec, and recommendations as to the route to be followed, as sent out by the Cabot Straits Ice Patrol (<i>q.v.</i>) Reports respecting dangers to navigation.
Sable Island, N.S. VCT	request	(1) North Atlantic (2) Nova Scotia and Nfld. Coasts	do. do. do. do.
Lurcher Lt. Vessel VDR	request	Bay of Fundy	do. do. do. do.
St. John, N.B. VAR	request	do. do.	do. do. do. do.
Grindstone Island, P.Q. VCN	request	(1) Gulf of St. Lawrence (2) Straits Belle Isle and Cabot Straits. (3) Nfld. coast	do. do. do. do.
Grosse Island, P.Q. VCD	request	River and Gulf of St. Lawrence	do. do. do. do.
Clarke City, P.Q. VCK	request	do. do. do.	do. do. do. do.
Montreal, P.Q. VCA	request	do. do. do.	do. do. do. do.
Heath Point Lt. Vessel VCI	request	do. do. do.	do. do. do. do.
Point Amour, Nfld. VCL	request	do. do. do.	do. do. do. do.
(All 600 m. spk.)			
Canadian Govt. Cabot Straits Ice Patrol Vessel, 600 spk. VCQ	0100 1300	An ice patrol is maintained in the Gulf of St. Lawrence, between Cape Ray and Heath Point, from the opening of navigation in the spring until the route is clear of ice.	

A regular message embodying ice conditions from Cape Race to Quebec, and recommendations as to the route to be followed, is compiled by the ice patrol every four hours commencing at 0500, and kept for immediate transmission to ships upon request.

Similar information is also broadcast at the scheduled times; and, also, to ships requesting it, by North Sydney Grindstone Is. and Cape Race W/T stations (*q.v.*).

Ships requiring the latest information concerning the Gulf of St. Lawrence route should call the ice patrol vessel on 600 m. spk.

The work of the ice patrol will be greatly facilitated if incoming vessels will co-operate in supplying information regarding ice conditions in their vicinity. Continuous watch is maintained.

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(3)	(3)	(4)
CANADA—contd.			
Great Lakes			Information re dangers to navigation
Kingston, Ont. VBH	0400† 1600†	Lake Ontario and St. Lawrence River to Montreal	do. do. do. do.
Toronto, Ont. VBG	0340† 1540	Lake Ontario	do. do. do. do.
Port Burwell, Ont. VBF	0400† 1600†	Lake Erie	do. do. do. do.
Point Edward, Ont. VBE	0410† 1610†	Lake Huron	do. do. do. do.
Midland, Ont. VBC	0400† 1600†	Georgian Bay and Lake Huron	do. do. do. do.
Sault Ste Marie, Ont. VBB	0420† 1620†	Lake Superior and Lake Huron	do. do. do. do.
Port Arthur, Ont. VBA	0430† 1630†	Lake Superior and Thunder Bay	do. do. do. do.
Tobermory, Ont. VBD	request	Georgian Bay and Lake Huron	do. do. do. do.
NOTE.—Continuous watch is kept by the above stations on 600 m., but broadcasts at routine hours are carried out on the 1,600 m. wave.			
CEYLON			
Colombo, VPB, 600 sp. ..	—	—	Broadcasts warnings when necessary
CHILE			
Valparaiso, CCE, 1,000 sp. ..	0100*	Transmits notices to mariners of an urgent character containing information of immediate importance to seamen. The messages are preceded by the letters OHC	
CHINA			
Shanghai, FFZ, 750 sp.	—	—	Navigation warnings are some- times sent, e.g. lightships displaced by typhoons, wrecks located, etc. (Winter months only.) International Ice Code
DANZIG FREE STATE			
Danzig, DG, 1,950 c.w. ..	0735†	Code No. Station .. 10 Danzig Roadstead. 11 Danzig Harbour	(Winter months only) International Ice Code
Danzig, KAZ, 600 sp. ..	0700† 1000† 1300† 1600† 1800† request	Local Baltic Coast	Do do.
DENMARK			
Blaavand, OXB, 600 sp. ..	1120 2120	Ice conditions in the main Danish waterways compiled from information received by the Meteorological Institute	Messages <i>en clair</i> (in English) — • — • — OXB OXB OXB. Ice report. This is followed by the number of words comprising the message proper, and then the text of the latter, con- cluding with — • — • —. The text only is repeated, and the message ends with : OXB OXB OXB. • • • — • — Example — • — • — OXB OXB OXB. Ice report 26 w Kattegat westchannel closed for sail- ing vessels; Kattegat east channel, pack- ice; steamers beset; Kattegat southern part open ice. Sound and Belts: driftice; along west coasts packice. All lightships removed — • • • — (Repetition of foregoing) OXB OXB OXB • • • — • — As for Blaavand (above), except for call sign Messages <i>en clair</i> (Danish)
Copenhagen, OXA, 600 sp. ..	1100 2100	do. do. do.	do. do. do. do.
Lynghy (near Copenhagen) ONE, 2,400 R/T	0930 1530 2045	Information regarding ice con- ditions received by the mete- orological Institute Further information and a <i>sum- mary</i> compiled from informa- tion received A short W.R. with special regard to influence on ice conditions	do. do. do. do.
ESTHONIA			
Hapsal, AZI, 3,600 c.w. ..	0725	Group I.—1 Zerel, 2 Filsand, 3 Dagerort. Group II.—4 Kynö, 5 Werder, 6 Worms Group III.—7 Pakerort, 8 Reval, 9 Stenskar	International Transmitted during winter months only

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
FINLAND			
Helsingfors, OJA, 1,500 sp. (see notes)	1458* AA	Björkö Sound Region of Werkkomatala The Sea W. from Björkö Fairway Wiborg—Trangsund Fairway Trangsund—Rödhäll Outside Rödhäll	Ice conditions as ob. on the morning of issue AA IN IN IN IN IN IN BB IN IN IN IN IN IN CC IN IN IN IN IN IN etc.
	BB	Kotka Harbour and neighbourhood Outside Rankö Outside Luppi The Sea E. from Hogland The Sea S. from Hogland The Sea W. from Hogland	The double letters AA, BB, etc. divide the message into 10 main groups each one consisting of two sub-groups with three pairs of the letters IN in each. The letters IN indicate the conditions in a distinct area or fairway. These areas are given in order in the previous column
	CC	Helsingfors S. Harbour and neighbourhood Outside Sveaborg Outside Gräskärsbadarna At Porkola Outside Kallbadan Barösunds Fjärd	I = Ice conditions 0 Clear of ice 1 Light ice 2 Close sludge 3 Fixed sheet of ice 4 Drift ice 5 Packed ice 6 Close packed drift ice 7 Rift in the ice parallel to the coast 8 Screwed ice 9 Coarse ice masses X No information
	DD	Hangö Harbour and neighbourhood At Russarö The outer Sea off Russarö Hangö W. Fjärd S. Gullkrona Fjärd	N = Effect on Navigation 0 Navigation unobstructed 1 Navigation unobstructed for steamers difficult for sailing vessels 2 Navigation difficult for small steamers, dangerous for sailing vessels 3 Navigation only possible for large steamers without ice breaker 4 Navigation only possible for steamers strengthened for ice, without help of ice breaker 5 Navigation channel kept open 6 Navigation channel kept open with the assistance of ice breaker 7 Navigation interrupted 8 Sea mist, fog or snow 9 Navigation closed X No information
	EE	Abo Harbour to Stora Bocken Erstan Fjärd Widskär Fjärd Around Utö The outer Sea off Utö Skiftet	The message may be abbreviated as follows:— (1) If the ice and navigation conditions of all the areas of one main group are the same, the message given after the pair of letters (AA or BB, etc.) only one pair of symbols IN, e.g. AA 3.
	FF	At Ledsund E. of Nyhamn The Sea outside Kobbaklinter Archipelago of Mariehamn W. of Eckerö The Sea towards Sälkäskär	(2) If the ice and navigation conditions of all the areas of several successive main groups are the same only the pairs of letters, followed by only one pair of symbols will be issued e.g. BB CC DD OO
	GG	The Archipelago of Raumo The inner Sea off Raumo Region of Relandersgrund Mäntyluoto Harbour and neighbourhood Outside Kallö and Räfsö The outer Sea off Räfsö	(3) When there is no need to issue warnings for a whole main group, this group will be omitted NOTE.—If the conditions of a whole main group are unknown, this group will not be omitted, but treated as under (1), e.g., FF XX
	HH	Wasklot Harbour and neighbourhood Storhåsten to Ensten Entrance of Rönnskär Entrance of Norskär Jacobstad Harbour Adö roadstead	The report is immediately repeated on 600 sp.
	II	The Sea outside Mässkär Yxpilä Harbour Inside Tankar The Sea off Tankar Brahestad roadstead The Sea towards Nahkiainen	
	JJ	The Sea off Isokraaseli to N. Outer Harbours of Uleaborg Fairway to Uleaborg The Sea off Marjaniemi Kemi Harbours The Sea off Kemi	

Hangö, OJD, 600 sp. . . . request do. do. . . do.

Repeat of Helsingfors message to vessels under way. This station will also answer any questions concerning the Ice Code

FRANCE

REGULATIONS CONCERNING W/T NAVIGATIONAL WARNINGS FOR FRANCE, ALGERIA AND TUNISIA.

Important information of an urgent character concerning navigation is transmitted by the French W/T stations enumerated below.

The information will include particulars of light-vessels adrift or seriously damaged; lights extinguished or damaged; establishment of temporary lights; wrecks and derelicts dangerous to navigation; floating mines, approximately between the French coast and the meridian 30° W. of Greenwich, and the parallels of 43° N. and 52° N. (English Channel and North Atlantic areas), and as far as the meridian of 12° E. of Greenwich. (Western Mediterranean area). Also, any other information valuable to the navigator outside the limits of the zones of obligatory pilotage, which has not already been issued through the medium of the ordinary French Notices to Mariners.

Method of Signalling.—The message will commence with—

TTT AVURNAV

which indicate the sending of urgent messages concerning the safety of navigation; followed by the text of the notice in French and *en clair*.

Approximate geographical positions will be given in latitude and longitude (Greenwich) in the form of three groups as follows:—

(a) The first and second groups consist of four figures each, representing the degrees and minutes of latitude and longitude, respectively. (If the number of degrees or minutes is less than 10, the tens figure is signalled as 0: if the number of degrees longitude exceed 99, the hundreds figure is omitted.)

(b) The third group consists of two letters (either NSE or W) expressing the direction of latitude and longitude.

If the exact position is signalled it will be by bearing (0° – 360°) and distance (nautical miles) to an accurately determined point.

Form of Message.—Suppose that Brest has to signal on January 10th at 22h. 20m. that there is a dangerous floating wreck in $48^{\circ} 40' N.$, $8^{\circ} 05' W.$

The message will be worded thus:

TTT. AVURNAV, Brest. Epave flottante dangereuse—48.40—0805—NW—2220/10/1.

Transmission will take place twice daily, and continue for a week if necessary. The original time and date of the message is always repeated.

The messages are broadcasted gratuitously by the following W/T stations:—Cherbourg—Rouges Terre, Brest—Mengam, Lorient—Pen Mané Rochefert, Porquerolles, Bizerta—Seti Meriem, and Oran-Ain el Turk.

W/T stations also repeat the navigational warnings on request. In this case a charge of 6 francs (gold) is made for each message, unless "Néant" (nothing to report) is sent.

NOTE.—In order to provide a rapid and efficient service it is important to have the co-operation not only of the coastal authorities but equally that of ships at sea. To effect this, masters of vessels encountering any danger to navigation are requested to immediately inform all ships in the vicinity, and also the authorities at the nearest port; and if equipped with W/T installation to at once transmit the intelligence to the nearest coast W/T station, preceding the message by the safety signal (TTT), addressing it to the Prefect Maritime, and endorsing it with the name and owners of the ship.

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
Bonifacio, FFC, 600 sp. ..	request	—	—
Bordeaux (Le Bouscat), FFX, 600 sp.	request	—	—
Boulogne, FFB, 600 sp. ..	request	—	—
Brest (Mengam), FUE, 600 sp.	—	English Channel and North Atlantic	—
Cherbourg (Rouges Terres), FUC, 600 sp.	request	English Channel	—
Dunkerque, FUD, 600 sp. ..	request	—	The messages are also repeated during the following times: 0200-0400; 0800-1000; 1600-1800; 2000-2200 G.M.T.
Le Havre, FFH, 600 sp.	request	—	—
Lorient (Pen Mané), FUN, 600 sp.	request	North Atlantic	Navigational warnings will NOT be transmitted during the following times 0800-1000; 1200-1400; 1600-1800; 2000-2200 (see Dunkerque above)

GUN PRACTICE WARNINGS.—In the event of gun practice taking place at Gâvre or Talud batteries, the under-mentioned W/T notice will be transmitted in French and English by Pen Mané W/T Station one hour prior to the commencement of firing and at every subsequent hour:—

Pen Mané to all ships in vicinity.

Gun practice at Gâvre battery (Lorient) or Talud battery (Lorient) or l'Eve battery (St. Nazaire)

NOTE.—The messages relating to the first two batteries will be transmitted on low power, and that relating to the last on high power.

(1)	(3)	(3)	(4)
Nantes (Basse Lande), UA, 2,800 sp.	0800-1815 1600-1700 2100-2130	Atlantic Ocean Do. do. Do. do.	Urgent messages issued by the French Hydrographic Service

FRANCE—*contd.*

GUN PRACTICE WARNINGS.—In the event of gun practice taking place, a W/T notice will be sent on the previous day, in French and English successively, to ships in the Atlantic by Basse-Lande W/T station on 2,800 metres (spark) from 0800 to 0815, from 1600 to 1700, and from 2100 to 2130, in the following form:—

All ships in Atlantic.

Gun practice will take place on the (date) at Gavre battery (Lorient), or Talud battery (Lorient) or l'Eve battery (St. Nazaire).

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report	Codes and Notes.
(1)	(2)	(3)	(4)
Ouessant, FFU, 600 sp.	request	Western Mediterranean ..	The messages are also repeated during the hours of watchkeeping for ships with single operators (Zone A) NOTE.—The navigational warnings will not be transmitted on request during the following times:—0800-1000, 1200-1400, 1600-1800, 2000-2200
Porquerolles, FUQ, 600 sp. ..	—	North Atlantic	
Rochefort, FUR, 600 sp. ..	request		

FRENCH GUINEA

Konakri, HWD, 600 sp. ..	0805 1605	Repeats the navigational warnings sent by Dakar W/T station (see under "Senegal")	
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FRENCH INDO-CHINA**REGULATIONS CONCERNING NAVIGATIONAL WARNINGS IN FRENCH INDO-CHINA.**

Immediately after the transmission of the weather bulletin and typhoon warning, the stations mentioned in the schedule will broadcast, unless otherwise stated, navigational warnings issued by the Commandant de la Marine, French Indo-China.

Certain stations only transmit the warnings on request. In this case the message will be subjected to a fixed charge of 6 francs (gold), debited to the ship concerned. If, however, the message reads "Néant" (nothing to report), no charge is incurred.

These messages will give particulars of light vessels adrift or seriously-damaged; lights extinguished or damaged; establishment of temporary lights; wrecks or derelicts dangerous to navigation; floating mines, etc.; comprised approximately between the coast of French Indo-China, the meridians of Long. 102° and 112° E., and Lat. 6° N.

The message will give the time and date of issue, and will be repeated twice daily for a week, if considered necessary.

It is important to observe that in order that this service of information should be rapid and efficient, it is necessary to have the co-operation not only of the different Administrations on shore, but equally that of ships at sea.

To effect this, masters of vessels encountering a danger to navigation are invited to inform, at the earliest available opportunity, ships in the immediate neighbourhood, and also the maritime authorities of the first port they are able to communicate with.

Every ship fitted with a W/T installation is earnestly requested, when the existence of a grave danger has been verified, to send an urgent signal to any of the W/T stations in the accompanying schedule, as soon as she is within communicating range, preceding the telegram by the Danger Signal (TTT), addressing it to the Commandant de la Marine, Saigon (telegraphic address: "Marine, Saigon"), and endorsing the message with the names of the ship and owner. This telegram will be liable to the W/T charges in force.

(1)	(2)	(3)	(4)
Fort Bayard, HVH, 1,800 ..	request	Gulf of Tong King	—
Fu Kok, HVP, 600 sp. ..	request	Cochin-China and Cambodia ..	—
Kien An, HVB, 600 sp. ..	0300 1330† request	Gulf of Tong King	—
Mitho, HVM, 600 sp. ..	0300 1330† request	Cochin-China and Cambodia ..	—
Pula Condore, HVO, 600 sp. ..	0300 1330† request	Cochin-China and Cambodia ..	—
Tourane, HVI, 600 sp. ..	0300 1330† request	Coasts of Annam	—

FRENCH WEST AFRICA

Port Etienne, HWI, 600 sp. ..	0805 1605	Repeats the navigational warnings issued by Dakar W/T station (see under "Senegal")	
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FORMOSA

Keeling, JFK, 600 sp. ..	as necessary		
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Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
GERMANY			
Borkum, KBM, 600 sp. ..	0300 0700 1100 1500 1900 2300 request	North Sea Coast	Warnings will be first transmitted immediately the information is received by the stations; afterwards at the fixed times stated for as long as necessary (from Nauen for a further 2 days only) The ice reports furnished by the Hamburg Sea Ob. are transmitted on request
Cuxhaven, KBX, 600 ..	request	North Sea portion of the German Coast	Actual condition of outer navigational marks
Kiel (Friedrichsort), KBK, 600 sp.	request	Baltic	Repeat of Hamburg Sea Ob. report broadcast by Swinemünde and also ice reports for the Baltic issued by other countries
Königswusterhausen, LP, 3,350 c.w.	0840†	For the German Coasts in the North Sea and Baltic	(Winter months only) INTERNATIONAL CODE.—Warnings issued by the German Marine Ob., Hamburg

Group 1.—1, Königsberg Canal to Königsberg; 2, Pillau, harbour and roadstead; 3, Swindmünde, harbour and roadstead.

Group 2.—4, Travemünde, harbour and roadstead; 5, Holtenau, Kiel Canal at Brunsbüttel; 6, Brunsbüttelkoog off-lying area in the Elbe.

Group 3.—7, Hamburg, off-lying area in the Elbe; 8, Brake (Weser), off-lying area in the Weser; 9, Nesserland (Ems), off-lying area in the Ems and harbour.

(1)	(2)	(3)	(4)
List, KAL, 600 sp. ..	request	North Sea Coast ..	Hamburg Sea Ob. reports
Nauen, POZ, 4,700 c.w. ..	0000* 1200*		Warnings in German, English and French
Norddeich, KAV, 1,100, 1,800 R T (see notes)	1015† 2130	Broadcasts important notices to mariners, more particularly as regards unforeseen damage to outerlight-vessels, coastal lights, fog signals and fairway marks in the North Sea Form of message:— — • • — — • • — — • • — — etc. (for one minute) — • — — • • — — Seenachricht — • • • — — Text of message • — — • — — The message is sent three times in succession, and the first transmission takes place immediately after receipt of the notice at the W/T station	

The warnings relate to the North Sea and will be announced by the signal — • • — — • • — — (X X X) for a minute, followed by the call signal of the station.

The text of the message will then be repeated three times.

Information concerning the actual condition of outer navigational marks, off the North Sea portion of the German coast, is transmitted on request.

A charge is made for the message

NOTE.—Norddeich should only be called when a vessel is unable to get through to Cuxhaven W/T.

Important navigational warnings also in addition transmitted by wireless telephone on a wavelength of 1,800 metres.

(1)	(2)	(3)	(4)
Norddeich, KAV, 1,100 ..	1015†		(Winter months only International Ice code)

Group 1.—1, List; 2, Husum; 3, Tönning.

Group 2.—4, Cuxhaven, off the Elbe; 5, Cuxhaven, Haven and entrance; 6, Brunsbüttelkoog, Canal entrance.

Group 3.—7, Glückstadt; 8, Hamburg; 9, Harburg.

Group 4.—10, Hoheweg; 11, Bremerhaven; 12, Bremen.

Group 5.—13, Aussenjade; 14, Innenjade; 15, Wilhelmshaven, Haven entrance.

Group 6.—16, Borkum, Wester Ems; 17, Nesserland; 18, Nesserland.

Group 7.—19, Kaiser Wilhelm Canal; 20, Kiel Förde; 21, Marienleuchte, Fehmarnbelt,

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by eport.	Codes and Notes.
(1)	(2)	(3)	(4)
GERMANY — <i>contd.</i>			
Pillau, KAP, 600 sp.	request	Baltic	Repeat of Hamburg Sea Ob. report broadcast by Swinemünde Form of message :— — • • — • • — — • • — • • — etc. for one minute. — • • — • • — Seenachricht — • • — • • — Text of message • • • • • The message is sent three times in succession and the first transmission takes place immediately after receipt of the notice at the W/T station Important navigational warnings are in addition broadcast by R/T on 1,800 metres (Winter months only) International Ice Code
Swinemünde, KAW, 1,100, 1,800 R/T (see notes)	1030† 2145†	Broadcasts important notices to mariners, more particulars as regards unforeseen damage to outer light vessels, coastal lights, fog signals and fairway marks in the Baltic	
Swinemünde, KAW, 1,100	1030†	Baltic	
Group 1.—1, Memel; 2, Pillau; 3, Königsberg—Sea canal. Group 2.—4, Danzig; 5, Stolpmünde; 6, Kolberg. Group 3.—7, Swinemünde—off sea; 8, Swinemünde—haven; 9, Stettiner Haff. Group 4.—10, Thiessow; 11, Arkona; 12, Barhöft. Group 5.—13, Warnemünde; 14, Wismar—to channel; 15, Travemünde. Group 6.—16, Marienleutche, Fehmarnbelt; 17, Fehmarnsund; 18, Bülk. Group 7.—19, Kaiser Wilhelm Canal; 20, Rendsburg—Eider; 21, Flensburg, Innenförde.			
Swinemünde, KAW	0725†	(3) Local 14 Sea off Swinemünde 15 Swinemünde harbour 16 Swinemünde bay	(4) (Winter months only) International Ice Code
Wilhelmshaven (3rd Entrance), KAN, 600 sp. (see notes)	request	North Sea Coast	Hamburg Sea Ob. reports NOTE.—This station also communi- cates on request the depth of water in Wilhelmshaven. The call should be made either on 450 metres (spark) or 1,250 metres (C.W.). The 600 metres wave is no longer employed
GREAT BRITAIN AND IRELAND			
Fishguard, GRL 600 sp.	0330 0910 1530 2100	St. George's Channel and Bristol Channel	Navigational warnings issued by the Admiralty, containing information re- lating to derelicts, temporary extinction of lights or displacement of principal aids to navigation, drifting mines, ice reports and warnings, etc. All these stations broadcast at times stated and also immediately upon receipt of information
Lands End, GLD 600 sp	0200 0800 1400 2000	English Channel and Bay of Biscay	
Port Patrick, GPK 600 sp.	0330 0910 1530 2100	North Channel and Firth of Clyde	
Wick, GKR 600 sp.	0200 0800 1400 2000	North Sea and Pentland Firth	
Cullercoats, GCC 600 sp.	0330 0910 1530 2100	North Sea	
North Foreland, GNF 600 sp.	0200 0800 1400 2000	English Channel and North Sea	
Valencia, GCK 600 sp.	0330 0910 1530 2100	Atlantic —	
Malin Head, GMH 600 sp.	0200 0800 1400 2000	Atlantic	
Seaforth, GLV, 600 sp.	request	Port of Liverpool	
Niton, GNI, 600 sp.	request	Port of Southampton	
			Special local reports only. These stations advise every ship approaching or leaving port

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
HAITI REPUBLIC			
Port au Prince, NSC, 2,255 sp.	0100 1300 1700 2100	—	—
HAWAIIAN ISLANDS			
Pearl Harbour (Honolulu), NPM, 2,255 sp.	0630 1830 2230	North Pacific	<p>NOTES: (1) Sent immediately after weather report, and also on request</p> <p>(2) Ship distress signals should be communicated to NPM (Wailupe) or NPH (Hilo), where 600 and 2,400 metres are guarded continuously</p>
HOLLAND			
Scheveningen, PCH, 1,800 sp.	1115 2315	—	<p>Storm signals preceded by the letters KNMI and navigational warnings preceded by the letters NBAZ sent in Dutch and English. Weather reports preceded by the letters KNMI only at 1115</p> <p>Beginning with the words "Ijsbericht Ice report," the code consists of two groups of four figures, and, as the harbours concerned are always signalled in the same order as given in the list each figure therefore represents the navigational conditions existing in the locality designated by its relative position.</p>
<p>List of Harbours.</p> <p>Group I.</p> <p>(a) Delfzijl (Ems)</p> <p>(b) Harlingen (Zuider zee)</p> <p>(c) Amsterdam (North Sea canal)</p> <p>(d) Zaandam (Voorzaan)</p> <p>Group II.</p> <p>(e) Helder (Zuider zee)</p> <p>(f) Rotterdam (Waterway)</p> <p>(g) Dordrecht (North)</p> <p>(h) Do. (Mallegat)</p>			
<p>CODE.</p> <p>Code Navigational Conditions.</p> <p>1 Navigation practicable.</p> <p>2 Do. difficult for sailing vessels.</p> <p>4 Do. very difficult; closed for sailing vessels.</p> <p>5 Do. only practicable for large steamers.</p> <p>7 Do. closed.</p> <p>NOTE.—The service is to be regarded as experimental for the present.</p> <p>The broadcasting of ice reports will begin when navigation is closed to small steamers and motor ships at any of the harbours mentioned above; and will cease when navigation is re-opened</p>			
ITALY			
Rome (Centocelle), ICD, 2,250	0630	—	—
Pola, IQZ, 3,000	0530 2030	—	—
JAN MAYEN ISLAND			
Jan Mayen, JN, 600, 1,000, 1,600	—	Around the Island of Jan Mayen (lat. 70° 59' N., long. 8° 18' W.)	Ice reports occasionally sent in special code
JAPAN			
Otchishi, JOC, 600 sp. ..	—	Warnings broadcast as necessary	
Choshi, JCS, 600 sp. ..	—	Do. do.	
Shiomisaki, JSM, 600 sp. ..	—	Do. do.	
Shimotsui, JSX, 600 sp. ..	—	Do. do.	
Tsuno-Sima, JTS, 600 sp. ..	—	Do. do.	
Ose-saki, JOS, 600 sp. ..	—	Do. do.	
KWANG-TUNG			
Dairenwan, JDA, 0 sp. 60 ..	—	—	As necessary

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
LATVIA			
Liepaja, KCB, 2,650 c.w. ..	1025	Code No. Reporting Station.	(Winter months only)
		1 Pappenze	(1) Ice Report in International Ice
		2 Libau	Code
		3 Stein Ort	NOTE.—Ob. are made the same-morn-
		4 Windau	ing at 0700 G.M.T.
		5 Lyser Ort	This message is followed by gal-
		6 Michael Lighthouse	warnings, state of sea and genera-
		7 N.W. of Domesness	weather.
		8 N.E. of do.	The whole of the ice report (or one
		9 S.E. of do.	part thereof) is also transmitted on
		10 Messaragotsem	request. A charge is made for this
		11 Off Riga	message. Ships should state whether
		12 Riga (port)	it is required in code or <i>en clair</i> ; sig-
		13 Hainasch	nalling "whole MSG," or the particula-
			group required, as for instance "only
			for Riga Gulf."
Riga, KCA, 1,400 sp. ..	1350	—	(Winter months only)
			The message is the same as that sent
600 sp. ..	1000	Latvian waters	by Liepaja (see above)
	2315		<i>En clair</i> messages in English trans-
			mitted immediately upon receipt and
			repeated at the scheduled times
			The messages are sent three times at
			intervals of 10 mins.
LITHUANIA			
Memel, RYM, 800 sp. ..	0700†	Code Station	(Winter months only)
		01 Memel-off sea	International Ice Code
		02 Memel—haven	
		03 Memel—see tief	
MALTA			
Rinella BYZ, 4,700 c.w. ..	0900	—	—
	2100†		
MEXICO			
Mazatlan de Sinaloa, XAE ..	1837	—	NAVIGATIONAL WARNINGS.
Campeche, XAB	1837	—	Mexican W/T stations intercept
Vera Cruz, XAA	1837	—	messages containing notices to mariners
Mexicalia	1900	Broadcast navigational warn-	emanating from foreign W/T stations
Hermosillo, XAH	1900	ings issued by W/T stations	These messages are broadcasted for
		between San Francisco and	three consecutive days according to the
		the Mexican boundary.	information given below. Message
Salina Cruz, XAN	1900	Broadcasts navigational warn-	containing information relating to
		ings issued by W/T stations	navigation dangers, received from
		situated between Rio Suchiate	ships at sea, are dealt with in a similar
		and Balboa	manner
Tampico de Tamaulipas, XAJ	1900	Broadcasts navigational warn-	
		ings issued by W/T stations	
		between Rio Bravo and	
		Florida; also by Tabo San	
		Antonio W/T station	
Payo Obispo XAC	1900	Broadcasts navigational warn-	
Mérida de Yucatán, XAM ..	—	ings issued by W/T stations	
(all above 600 sp.)		between Colon and Merida;	
		and also by Cuban W/T	
		stations	
MOROCCO			
Agadir, CNA, 600 sp. ..	request	—	See under France for regulations
Casablanca, CNP, 600 sp. ..	request	Various parts of Morocco	This station gives continuous service
			<i>En clair</i> message (English)
			Reports concerning the state of the
			sea at 0700

OROCCO—contd.

The station, having called up the stations at Agadir, Qnitra and Tangier, will transmit *en clair* a report, of which the following is an example :—

“Tangier—Casablanca—Agadir, roadstead practicable.

Qnitra, bar impracticable

CAUTION AS TO DANGEROUS SWELL.—Warnings are issued as soon as a dangerous increase of swell is observed, this has not already been signalled in the regular messages. The warning is repeated at the commencement of the period of watch for ships with single operators when the original transmission occurs in the interval between excessive watches. Each message is preceded by the International danger signal (TTT).

The ordinary navigational warnings are sent on request only.

NOTE.—This station gives continuous service.

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1) Mediouna, CNM, 600 sp., 1,500 sp. (see notes)	(2) 0945† 1615† 0945	(3) — Ports of Tangier, Casablanca, Safi and Mogador Rabat and Mehéduja—ports with bars	(4) Urgent notices to mariners are trans- mitted immediately on receipt on 600 metres; and at the scheduled times on 1,500 metres. If necessary, the notices will be repeated daily for one week “Ports Maroc” <i>En clair</i> message giving the state of communication with the shore at 0700 G.M.T.; any improvement or otherwise in the conditions since and information as to swell or fog The state of communication with the shore, the depth on the bar at high water, the improvement or otherwise of the conditions ascertained at 0700, and information as to swell or fog Issued by the Service de la Marine, Casablanca This station gives continuous service
Tangier, CNW, 600 sp. ..	request	—	
NEW BRITAIN			
Darbaul, VJZ, 600 sp. ..	request	Local	See under Australia: “Navigational Warnings.”
NICARAGUA			
Managua, NAZ, 952	0100 1300 1700 2100	—	
NORWAY			
Bergen, LGN, 600 sp. ..	request	—	Ice conditions report on request (charge, 4.50 gold francs) <i>En clair</i> message in English preceded by the words “urgent notices to mariners.” The warnings will be repeated daily for as long as considered necessary Ice conditions report (charge 4.50 gold francs) Ice conditions report (charge 4.50 gold francs) Do. do. As for Bergen 1430 message
Bergen, LGN, 1,850 c.w., re- peated on 600 sp.	1430†	Notices concerning navigable waters outside the pilotage limits for Norway	Ice conditions report (charge, 4.50 gold francs) Ice conditions report (charge, 4.50 gold francs) See Bergen 1430 message
Fauske, LDW, 600 sp. ..	request	—	
Flekkerø, LDF, 600 sp. ..	request	—	
Ingøy, LEI, 600 sp. ..	request 1600	Navigable waters outside the pilotage limits for Norway	
Röst, LFR, 600 sp. ..	request	—	
Tjømø, LET, 600 sp. ..	request 1830†	Navigable waters outside pilot- age limits for Norway	

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
NORWAY—contd.			
Utsire, LGK, 600 sp.	request 1600	— Navigable waters outside the pilotage limits for Norway	Ice conditions report (charge 4 gold francs) See Bergen 1430 message above
Vardö, LEK, 600 modulated c.w.	request 1600	— Navigable waters outside Nor- wegian pilotage limits	Ice conditions report (charge 4 gold francs) See Bergen 1430 message above
NOVA ZEMLYA			
Matochkin Shar, RFU, 2,000	—	Transmits information concerning the state of the ice (see Russian Ice Code)	
PACIFIC ISLANDS			
Papette (Tahiti), HVX, 600 sp.	1100† 2300†	—	Only sent when necessary and add. to weather report. Plain language messages in French and English Dangerous obstructions to navigatio Information also furnished to passi vessels on request.
Tutuila, NPU, 2,255 sp. . . .	0330 0730 2300	—	
PANAMA			
Colon, NAX, 1,817 sp.	1000* 1800*	Caribbean Sea	—
Balboa, NBA, 7,000 arc. . . .	1000* 1800*	Zone between the equator and lat. 20° 00' N.	—
PHILIPPINE ISLANDS			
Kavite, NPO, 5,260 c.w., 2,702 sp. (together)	0300* 1400*	—	—
PORTO RICO			
San Juan, NAU, 4,850 arc. . . .	0100 1300 1700 2100	Local	—

RUSSIA**RUSSIAN ICE CODE.**

The following regulations are in force as regards the forwarding of ice reports by W/T from ships at sea in Russian waters, and the broadcasting of information concerning ice conditions by Russian W/T stations.

Form of message: III.

YYZZ φφφφ λλλλ KLPC followed by remarks *en clair*.

Code.

Meaning.

III = Call signal of ship or shore W/T station; or name of hydro-meteorological station.

YY = Day of the month (05 = 5th day).

ZZ = Time of observation in hours (00-23, thus 08 = 8 a.m., 20 = 8 p.m.).

φφφφ = Latitude in degrees and minutes.

λλλλ = Longitude do. do. (E. of Greenwich).

The hundreds are omitted.

K = Area of visible ice.

- 0 Sea clear of ice
- 1 1/10th or less of visible surface covered, or slight ice formation
- 2 2/10ths visible surface covered
- 3 3/10ths do. do. etc., etc.
- 8 8/10ths and 9 10ths do. do.
- 9 Whole surface covered

P = Navigation conditions.

- 0 Navigation unhindered
- 1 Single ice blocks
- 2 Ice in streaks
- 3 Sparce ice
- 4 Compressed ice (*i.e.*, frozen together)
- 5 Hummocky ice; navigation difficult
- 6 Impassable ice
- 7 Open places in ice
- 8 Leads or lanes in ice

USSIA—*cont'd.*

— Character of prevailing ice.

- 0 Ice beginning to form
- 1 Pancake ice; new ice (uncovered with snow)
- 2 Thin ice; smooth new ice at sea
- 3 Fine drift ice (size up to 20 metres)
- 4 Heavy drift ice (size over 20 metres)
- 5 Sheet and drift ice at sea
- 6 Drift ice with snow ice or newly-formed ice
- 7 Field ice
- 8 Field ice and drift ice
- 9 Floe ice, thick sheet ice

C = Visibility.

- 1 Visibility not exceeding $\frac{1}{2}$ cable; thick fog
- 2 Visibility not exceeding $\frac{1}{4}$ cable; heavy snow or rain
- 3 Visibility not exceeding 1 mile; fog
- 4 Visibility " " " " " snow or rain
- 5 Visibility not exceeding 3 miles
- 6 " " " " 5 "
- 7 " " " " 10 "
- 8 Exceptional visibility
- 9 Very changeable visibility

The portion of the message sent in plain language contains information not dealt with by code, such as presence of icebergs, polar ice, ice blink, and the strength and thickness of the ice.

Missing observations in the codes are replaced by the letter b (x).

The shore stations omit all references to latitude and longitude in their messages.

EXAMPLES.

(1) RZT 1208 7308 6215 0x05 (Meaning: A ship, call signal RZT, on the 12th of the month at 0800, in 62° 08' N., 62° 15' E., reports sea clear of ice, visibility 3 miles).

(2) KAB 0515 7512 6518 3336 (Meaning: A ship, call signal KAB, on the 5th at 1500 in 75° 12' N., 65° 18' E., reports area of ice 3/10ths of visible surface covered, thin ice, leads in ice, visibility 5 miles).

(3) COC 2508 8857 (Meaning: Shore W/T station, call signal COC, on the 25th at 0800 reports area of ice 8/10-9/10ths surface covered, field ice and hummocky ice, navigation difficult, visibility 10 miles).

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
Petrograd-Detskoye Selo, RET 7,100 c.w.	0915† and 1100†	Gulf of Finland and White Sea Gulf of Finland	Russian Ice Code <i>En clair</i> message (English)
Murmansk, REE, 1,800	1600 1630	Barents Sea and White Sea ..	Russian Ice Code <i>En clair</i> message is in Russian and English The message is repeated the following day. Particularly important warnings are transmitted immediately upon receipt
Mugorski Shar, RCX, 1,500..	1600 1630	Each navigational radiogram will begin with the word (Pilot) followed by the call signal of the transmitting station and TTT; after which will follow the navigational warning in the Russian language, the message ending with TTT. Immediately after the message will be repeated in English, commencing with the word Pilot, the call signal of the transmitting station and TTT; followed by the text of the navigational warning sent twice and ending with TTT. The message will be repeated on subsequent days for as long as considered necessary Exceptionally important information will be broadcast immediately without waiting for the scheduled transmission	
Tzuip Navolok, REF, 600 sp.	—	—	This station answers calls from passing vessels and will arrange for a pilot into Kola Inlet if requested.
Okanka, RED, 1,500 ..	1630 1700	—	do. do. do.
Archangel Isakogorka, REA, 2,500	1330- 1400†	White Sea	<i>En clair</i> message in Russian and English. The message is repeated the following day. Particularly important warnings are transmitted immediately upon receipt. During the winter this is augmented by a report, <i>en clair</i> , concerning ice conditions in the White Sea from Svyatoi Nos to Modyugski
Kronstadt, KRNS, 800-1,200	—	—	—

RUSSIA—contd.

GULF OF FINLAND LIGHTS.—In the winter during the period when all lights of lighthouses in the territory of the Soviet Republic are extinguished, should the necessity arise for them to be exhibited, the following rules are promulgated for calling up Kronstadt W/T station to enable this to be carried out :—

- (1) A vessel coming from seawards will send the call KRNS and the letter A (● —) five times, followed by her name and the port of registry.
- Four hours after the despatch of this message the following lights will be exhibited :—Shepeley I., Toboukin, and the leading lights, Kronstadt.
- (2) A vessel proceeding to sea from Kronstadt, or from that place to Petrograd or *vice versa*, will send a similar request to the pilot-district concerned, either by messenger or telephone, four hours prior to sailing.
- (3) On arrival at Petrograd or Kronstadt, the vessel should inform the pilot-district concerned, in order that the lights may be extinguished.
- (4) A vessel proceeding to sea and not requiring the use of the lights, should send the call KRNS followed by ten dots (● ● ● ● ● ● ● ● ● ●), her name and port of registry.
- (5) If a steamer is met at sea, or is being escorted from Petrograd to Kronstadt by an ice breaker, the latter will make the necessary arrangements for the exhibition of lights.
- (6) A wavelength of 800-1,200 metres is to be used for these messages.

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1) Russian Maritime Province	(2)	(3)	(4)
Vladivostok, RCW, 1,500 ..	1015	Transmits daily information concerning alterations to navigational aids and any other matter of interest to the navigator. The message is sent twice in Russian and once in English	

In order to facilitate entry into Vladivostok Harbour, vessels approaching from seaward will be informed of the conditions and movement of the drift ice in Ussuri Bay, and also the most suitable fan-shaped passage to Skrypleff Island, four times in every 24 hours by W/T signals. These signals will be transmitted in the following order, commencing with the heading "!!! RCV ice radio" :—

- No. 1 : Time of drift ice observations (local mean time from 00 to 23).
- No. 2 : An angle with vertex at the summit of Skrypleff Island. The safest passage to Skrypleff Island will be the centre of this angle.
- No. 3 : The distance between Skrypleff Island and the end of the drift ice in the above shaped passage.
- No. 4 : The direction of movement of the drift ice.

There will be intervals between the above signals.

For the fan-shaped passage the line of reference will be south and directions will be given in points east or west of it.

The signals will be transmitted at 9h., 13½h., 17h., and 22h. Vladivostok standard time. The signals given at 22h., however, will only be a repetition of those at 17h.

As an example of the above, if according to observations at 8h., the best fan-shaped passage through the drift ice was between S. 2 points W. and S. 7 points E., the limit of the drift ice in this passage was 22 miles distant from Skrypleff Island, and the movement of the ice towards the N.N.W., then W/T signals would be transmitted as follows :—

!!! RCV RCV ice radio — ● ● ● —
8, S W 2, S E 7, 22 miles, N N W, RCV ● ● ● — ● —

(1) SENEGAL	(2)	(3)	(4)
Dakar, HWB, 600 sp. — ..	—	—	—

Broadcasts navigational warnings issued by the Commandant de la Marine, Senegal, in accordance with the regulations given for France, Algeria and Tunisia (*q.v.*).

The message is repeated twice daily beginning with the first transmission, until the necessity has ceased to exist, or for a maximum period of a week. It is also repeated to ships on request, for which a charge of 6 francs (gold) is made.

(1) SOUTH AFRICA	(2)	(3)	(4)
Table Bay, VNN, 600 sp. ...	—	Communication is restricted to official messages concerning the safe navigation of vessels into port during fog or haze	
SPITZBERGEN			
Spitzbergen, LFG, 600 sp. ...	—	Transmits to ships on request, and on payment of a charge of 4.50 francs (gold) a report on the ice conditions	

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
SWEDEN—contd.			
Hernösand, SAH, 600 sp. ..	1655 2155	Gulf of Bothnia	Ice warnings as issued by the Pilotage Department
Vaxholm, SAF, 600 sp. ..	1650 2150	Southern and Northern Baltic and Gulf of Finland	
Gotland, SAE, 600 sp. ..	request	Do. do.	
Karlskrona, SAA, 600 sp. ..	request	From Kullen Lighthouse to Salmis Pilot Station	
Göteborg, SAB, 600 sp. ..	1700 2200	The Skagerrak, Kattegat, and Oresund	
TUNIS			
Bizerta Seti-Meriem, FFW, 600 sp.	request	Western Mediterranean	See under France for regulations
UKRAINE			
Novorossisk, RDN, 1,100 sp.	—	—	—

Ships bound for Novorossisk must report their approach by W/T from a distance of at least 40 miles and require permission to enter the harbour, stating the object of their coming, their position by latitude and longitude, and time of arrival at the pilot rendezvous. Pilots for Novorossisk should be obtained at Ghelenjik.

(1)	(2)	(3)	(4)
Sevastopol, RCT, 2,500 ..	1200	Conditions at Sevastopol, Eupatoria, Yalta, Kertch, Taganrog Tuapse	En clair message giving ice conditions (see under Weather Reports)

URUGUAY

Cerrito (Monte Video), CWA,
600 sp.

U.S.A.**UNITED STATES NAVIGATIONAL WARNINGS: PROCEDURE.**

The procedure, as far as masters of vessels are concerned, is divided into two parts:

(a) Sending hydrographic information to the U.S. Naval W/T stations.

(b) Receiving information twice daily when within range of the distributing W/T station of its zone.

Information will not be broadcast unless danger to a vessel is involved, either from collision or a resulting inadequacy of aids to navigation.

All hydrographic information, which includes reports on ice, wrecks, derelicts, floating obstructions, and important changes in aids to navigation, should be addressed to the Hydrographic Office and any of its branch offices by mail, and to any of the following naval radio stations by radio, addressed "Govt. Hydro."

U.S. naval radio stations	Call letters	U.S. naval radio stations	Call letter
ATLANTIC OCEAN		PACIFIC OCEAN	
Boston ..	NAD	Balboa ..	NBA
New York ..	NAH	San Francisco ..	NPG
Philadelphia ..	NAI	North Head ..	NPE
Norfolk ..	NAM	Puget Sound ..	NPC
Charleston ..	NAO		
New Orleans ..	NAT		
Galveston ..	NKB		
St. Thomas, Virgin Islands ..	NBB		
San Juan ..	NAU		
Navassa Island ..	NKC		
Guantanamo, Cuba ..	NAW		
Colon ..	NAX		
		GREAT LAKES	
		Great Lakes, Ill. ..	NAJ

WEATHER BUREAU.—Masters of vessels are reminded that all communications concerning weather should be forwarded to the Weather Bureau, Washington, D.C., and if sent by radio or telegraph should be addressed "Govt. Observer."

Under the subject "Weather" should be included all information of a meteorological nature, including reports, barometric pressures, wind force and direction, and movements of air strata. Forms and instructions for reports can be obtained from the Weather Bureau, Washington, D.C.

LIGHTHOUSE SERVICE.—A report of any buoys adrift or any deficiencies noted in lighted aids to navigation affecting United States waters should be also forwarded to the superintendent of the nearest lighthouse district (given in Light or Buoy List).

NOTE.—Most of the value of the above reports is lost by the delays which occur when the message is wrongly addressed.

S.A.—contd.

REPORTING DERELICTS AND VESSELS IN DISTRESS.

It frequently happens that masters of vessels, when sighting derelicts or vessels in distress, and in reporting them by radio, fail to observe and report essential data as to the condition of the craft, necessary before a search can be begun by a United States Coastguard cutter. In consequence of this neglect it frequently becomes necessary for a searching cutter to send radiograms in an effort to obtain the necessary information. To be complete, information concerning a derelict should state:

- The position by latitude and longitude, confirmed by the approximate bearing and distance from a fixed point on land.
- The general condition of the vessel.
- Whether bottom up or awash.
- The trim of the vessel.
- Height of hull above water and any abnormal conditions as to buoyancy.
- As to whether masts are standing, sails set, or otherwise.
- Approximate heading of derelict.
- Force and direction of wind.
- Any observed current, its set and strength.
- The name of the vessel, if possible.

Similar descriptive information should also be furnished of vessels in distress. This information is necessary in order to determine roughly the direction and speed of drift of the derelict or vessel, and also to give an idea of the appearance of the object sought.

All the U.S. Naval W/T stations mentioned in the foregoing schedule are open at all times to receive reports concerning hydrographic information from masters of vessels. The messages are to be endorsed "Govt. Hydro," and transmitted in plain language, direct to the W/T station which disseminates the information relating to the area affected, as soon as the vessel is within normal range.

In preparing information for transmission, it is desired that messages be concise as consistent with exactness and clearness. The order of the message will be in the order of the importance of the items. To promote uniformity the following order of subjects is recommended:—

- Derelicts and sunken wrecks.
- Mines.
- Ice.
- Aids to navigation adrift.
- Floating rafts, logs, wreckage.
- Misplaced buoys in approaches to harbours.
- Other items considered sufficiently important to broadcast.

In order to avoid confusion in the interpretation of W/T messages, the U.S. Hydrographic Office has adopted the method of using four words for the co-ordinates of latitude and four words for longitude; thus, lat. 48° 02' N., long. 00° 00' W., will be transmitted as follows: Latitude four eight zero two north, longitude six eight zero zero west.

It is requested that messages emanating from ships be sent in accord with this practice.

NOTE: Vessels in the Caribbean Sea and West Indian waters north of the parallel of lat. 15° 00' N. should report to any of the undermentioned W/T stations, which will transmit the information via Key West to Savannah and New Orleans W/T stations:—

Country	Name of W/T station	Call Signal	Lat.	Long.
Virgin	St. Thomas ..	NBB	18° 20' N.	64° 56' W.
Porto Rico	San Juan ..	NAU	18° 28' N.	66° 06' W.
Cuba	Guantanamo ..	NAW	19° 55' N.	75° 09' W.
Windward Passage ..	Navassa I ..	NKC	18° 25' N.	74° 00' W.

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1) Boston, Mass., NAD, 1,363 c.w.	(2) 1600† 2200†	(3) Zone South of lat. 45° 00' N. and N.E. of a line joining Point Judith and Nantucket Shoals Light Vessel and N. of the parallel of Nantucket Shoals Light Vessel	(4) Also broadcasts North Atlantic Ice Patrol Reports (see below)
Atlantic Coast Charleston S.C., NAO, 2,607 sp.	1530† 2300†	Zone South of lat. 33° 00' N. and N.E. of a line joining Cape Sable (Fla.), and Cay Piedras (Cuba)	—
New York, NAH, 1,538 c.w. ...	1530† 2200†	Zone included between the parallels of lat. 42° 00' N., and 39° 30' N. NOTE.—This zone intentionally overlaps the Boston zone	Also broadcasts North Atlantic Ice Patrol Reports (see below)
Norfolk, Va., NAM, 1,360 sp.	1545† 2100†	Zone included between the parallels of lat. 38° 30' N. and 33° 00' N., the entrance to Chesapeake Bay, Hampton Roads, Newport, News and Norfolk	Also broadcasts all information relating to ice and its movement in the North Atlantic, which is received from the U.S. Coastguard Cutter on the N. Atlantic Ice Patrol (see below)

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
U.S.A.—contd.			
Philadelphia, NAI, 1,300 c.w.	1545† 2200†	Zone included between the parallels of lat. 39° 30' N., and 38° 30' N., including Delaware Bay	
Washington (Annapolis) 17,150 c.w.	2200		North Atlantic Ice Patrol Report (see below)
Washington (Arlington), NAA, 2,655 c.w. for 0255, 5,959 message c.w. for 1,530 message	0255*† 1530†		Also broadcasts North Atlantic Ice Patrol Reports (see below under Coastguard Cutters "Tampa" and "Modoc")
Gulf Coast			
Galveston (Texas), NKB, 1,817 sp.	1630† 2300†	Gulf of Mexico, West of the line Ship Shoal Light (La.) and Cape Catoche, Yucatan	
New Orleans, La., NAT, 2,607 sp.	1600† 2200†	Gulf of Mexico between the line, Cape Sable (Fla.), and Cay Piedras (Cuba), and the line, Ship Shoal Light (La.), and Cape Catoche (Yucatan), including the Yucatan Channel	
Great Lakes			
Cleveland, WJAX, 390 R.T.	1540† 1932†	Lake Erie, Detroit and St. Clair Rivers and Lake Huron	
Cleveland, Ohio, WTK, 706 sp.	1545 2145	The Lower Lakes	
Chicago, WGN, 370 R/T	0400		Broadcasts urgent hydrographic information
			NOTE.—From April 27th to Sept. 28 the message is transmitted at 2200 (75 meridian time), 0300 G.M.T., to conform to Chicago summer time
Chicago, WGO, 890 c.w.	0300 1700 2200	The Lower Lakes	
Duluth, WME, 600 sp.	1600 2200		
Great Lakes, Ill., NAJ, 1,988 i.c.w.	1545 2200 1600 2215	The Lower Lakes	
Pacific Coast			
North Head (Wash.), NPE, 2,726 sp.	0430† 2130†	Zone included between lat. 42° 00' N. and 46° 00' N.	
Puget Sound (Wash.), NPC, 2,499 c.w.	0300 1700† 2100†	Zone north of lat. 46° 00' N., including Vancouver and Queen Charlotte Sounds and Alaskan waters	
San Francisco, NPG, 1,330 c.w. and 4836 c.w. for 0330 message, 1330 c.w. for 0600 message, 7006 c.w. for 1700 message.	0330† 0600 1700† 0600	Zone included between lat. 33° 00' N. and 42° 00' N.	
Coastguard Cutters "Tampa" (NITC) or "Modoc" (NIVD) (North Atlantic Ice Patrol Service)			
600 metres, 1,100 and 1,700 (sp.) to ships; 1,621 metres, 1,200 and 2,400 (c.w.); at 1300 to Hydro., Wash. Also on request			

INTERNATIONAL ICE PATROL SERVICE.

For the purpose of carrying on the International Ice Observation and Ice Patrol Service provided for by the International Convention for the Safety of Life at Sea, London, 1913-14, the U.S. Coastguard Cutters "Tampa" and "Modoc" have been detailed for this service.

The object of the Ice Patrol Service is to locate icebergs and field ice nearest to the North Atlantic Lane Route. It will be the duty of the patrol vessels to determine the southerly, easterly, and westerly limits of the ice and to keep in touch with these fields as they move to the southward, in order that radio messages may be sent out daily giving the whereabouts of the ice, particularly the ice that may be in the immediate vicinity of the regular North Atlantic Lane Routes.

U.S.A.—contd.

During the months of March, April, May and June, and as much longer as necessary, these two vessels will obtain fuel and other necessary supplies at Halifax, N.S. They will alternate on patrol, making alternate cruises of about 15 days in the ice region, the 15 days to be exclusive of time occupied in going to and from base. The movements of the vessels will be so regulated that on the fifteenth day after reaching the ice region the vessel on patrol will be relieved by the second vessel, if possible, at which time the first vessel will proceed to base, replenish her fuel supply, and return in time to relieve the other vessel at the end of the latter's 15-day cruise. It is important that the patrol be continuous, and the vessel on patrol will not leave her station until relieved by the other vessel unless it is absolutely necessary to do so.

Having located the ice, the patrol vessel will send the following daily radiograms. The time used in all messages is 75th meridian time (add 5 hours to obtain G.M.T.).

- (a) At 1100 G.M.T. and 2300 G.M.T. ice information will be sent broadcast for the benefit of vessels, using 600 metre wavelength (spark). This message will be sent three times, with an interval of two minutes between each.

NOTE.—Broadcasts by spark will be eliminated as soon as possible, and vessels are advised to equip themselves with c.w. receivers.

- (b) At 0000 G.M.T. and 1200 G.M.T. ice information will be sent broadcast by radio on 1,621 metres (185 kilocycles) c.w. These broadcasts will be sent three times, with an interval of two minutes between each.
- (c) At 0100 G.M.T. a radiogram will be sent to the Hydrographic Office, Washington, D.C., through the nearest land radio stations, defining the ice danger zone, its southern limits, or other definite ice news, while other messages will be sent during the night if any later information is obtained by the patrol ship. The telegraphic address of the Hydrographic Office is "Hydrographic, Washington, D.C."
- (d) Ice information will be given at any time to any ship with which the patrol vessel can communicate on commercial traffic frequencies (wavelength).

Ice information will be given in as plain, concise English as practicable, and will state in the following order:—

- (a) Position of patrol vessel.
(b) Location and description of ice.
(c) Other data.

While on this duty the patrol vessel will endeavour by means of daily radio messages to keep ships at sea advised of the limits of the ice field, etc.

The ice patrol vessel's radio call letters are NIDK. They will use a wavelength of 600 metres (spark) when communicating with passing vessels.

The radio messages from the patrol ships will be given publicity by the Hydrographic Office as follows:—

- (a) By radio broadcast from—

Station	75th meridian, standard time	Wavelength (metres)	Station	75th meridian standard time	Wavelength (metres)
Arlington	{ 10.30 a.m.	5,996 c.w.	Norfolk	{ 10.45 a.m.	1,363 sp.
Annapolis	{ 9.55 p.m.	2,655 a.c. tube		{ 4.00 p.m.	
	{ 5.00 p.m.	17,150 c.w.		{ 6.00 a.m.	600 sp.
Boston	{ 11.00 a.m.	1,363 t.d. tube	Ice-Patrol ship ..	{ 6.00 p.m.	
	{ 5.00 p.m.			{ 7.00 p.m.	1,621 c.w.
New York	{ 10.30 a.m.	1,538 t.d. tube		{ 7.00 p.m.	(185 kc.)
	{ 5.00 p.m.				

- (a) All reports of ice are published in the Daily Memorandum and the Weekly Hydrographic Bulletin.

NOTE.—The work of the U.S. Coast Guard cutters engaged on ice patrol duty will be greatly facilitated if the principal Trans-atlantic steamship companies instruct the masters of their vessels to report the following data by radio to the patrol vessels:—

- (a) Icebergs or obstructions sighted, giving date, time, latitude, longitude, and direction of drift if an iceberg, together with the temperature of the water at the time.
- (b) Surface temperature of the sea water every four hours when between latitude 39° N. and 48° N., and crossing longitudes 52° W. and 44° W., when bound either east or west, and giving the latitude and longitude, course, and speed at time of each observation. **These data will facilitate the plotting of a temperature curve which will be useful in locating the branches of the Labrador Current.**

RADIO INTERFERENCE WITH MESSAGES FROM THE ICE PATROL VESSELS.

The ice patrol vessels send out information daily relative to the ice conditions, at 6 a.m., 7 a.m., 6 p.m., and 7 p.m. (75th meridian time). It is therefore requested that masters and others will instruct their radio operators to desist, as far as practicable, from operating at the above times.

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
VIRGIN ISLANDS			
St. Croix, NNI, 450 sp. ..	0100	—	Hurricane warnings when issued repeated at 4 hr. intervals
St. Thomas, NBB, 1,685 sp. ..	1300 1700 2100	—	Hurricane warnings when issued repeated at 4 hr. intervals
WINDWARD PASSAGE			
Navassa Island, NKC, 600 sp.	0100 1300 1700 2100	—	—

(4)—GENERAL SECTION.

Union Radio Scientifique Internationale (U.R.S.I.).

The U.R.S.I. was founded in July, 1919, with the object of co-ordinating radio research on fundamental measurements and principles along International lines as a world study.

President of the Union : Général Ferrié (France).

Vice-Presidents: MM. Austin (United States), Eccles (Great Britain), Vanni (Italy).

General Secretary: M. Robert Goldschmidt (Belgium), 54, Avenue
des Arts, Brussels.

The work of the Union is supervised by its various committees as follows :

- (1) High-frequency measurements and standard wavelengths. (Chairman, M. Abraham.)
- (2) Principles of wave propagation, variations in the electro-magnetic field, radio direction finding, etc. (Chairman, M. Austin.)
- (3) Atmospherics. (Chairman, Professor Eccles.)
- (4) Liaison with wireless operators and amateurs, in order to devise simple methods so that they can take part in useful researches. (Chairman, M. Vanni.)

In co-operation with the U.R.S.I., the high power stations at Nantes (call UA), Bordeaux (call LY), Eiffel Tower (call FL), and San Paolo (Rome) (call IDO) transmit carefully calibrated waves of standard frequency. Particulars of these and other issues are to be found below.

U.R.S.I. Signals.

French Stations.

Since February 1st, 1922, the following French Stations have transmitted U.R.S.I. signals. The transmissions are made *daily* at the times indicated :—

(1) *Eiffel Tower* (FL)

Station particulars :

Latitude	..	..	..	48° 48' N.
Longitude	..	..	..	02° 15' E.
Effective height of aerial	..	..		85 metres
Spark transmission :—				
(1) Wavelength	..	..		2,600 metres
(2) Frequency	..	..		115.300 K.C.
Intensity of current in aerial	..	..		85 amps
Energy in aerial	..	..		55 K.w.
Resistance of aerial	..	..		7.6 ohms

Procedure.

At 1034 G.M.T. URSI de FL.....URSI de FL..etc.
(exact wavelength and energy in
aerial of previous day's transmission).

At 1036 G.M.T. Two minutes dash.

At 1038 G.M.T. Preparatory signals preceding the ordinary semi-automatic T.S. of 1045.

(2) *Bordeaux (La Fayette)*. (L.Y).

Station Particulars :—

Latitude	.. .. .	44° 42' N.
Longitude	.. .. .	0° 48' W.
Effective height of aerial	.. .. .	170 metres

Continuous wave transmission :—

(1) Wavelength	.. .. .	23,450 metres
(2) Frequency*	.. .. .	12,800 K.C.
Intensity of current in aerial	.. .. .	480 amps
Energy in aerial	.. .. .	300 K.w.
Total resistance of aerial	.. .. .	1.17 ohms

Procedure.

At 1955 G.M.T. URSI de LY URSI de LY, etc.
(Exact wavelength and energy in
aerial of previous day's transmission).

At 1956 G.M.T. Two minutes dash.

At 1958 G.M.T. Preparatory signals preceding the
scientific T.S. (rhythmic beats) of 2000 G.M.T.

(3) *Nantes*. (UA).

Station particulars :—

Latitude	.. .. .	47° 10' 40" N.
Longitude	.. .. .	1° 42' 00" W.
Effective height of aerial	.. .. .	135 metres

Continuous wave transmission :—

(1) Wavelength	.. .. .	9,000 metres
(2) Frequency	.. .. .	33,333 K.C.
Intensity of current in aerial	.. .. .	180 amps

Procedure.

At 1415 G.M.T. URSI de UA . . . URSI de UA . . ., etc.
(Exact wavelength and energy in aerial
of previous day's transmission).

At 1416 G.M.T. Two minutes dash.

NOTE.—In the absence of accurate information as to the exact wavelength and energy in the aerial of the transmissions of the previous day, a series of the letter "x" will be transmitted in place of these figures.

Italian Station.

San Paolo (Rome) IDO.

Station Particulars :—

Latitude	.. .. .	41° 52' 00" N.
Longitude	.. .. .	12° 31' 00" E.
Effective height of aerial	.. .. .	120 metres

Continuous wave transmission :

(1) Wavelength	.. .. .	10,850 metres
(2) Frequency	.. .. .	28,600 K.C.
Intensity of current in aerial	.. .. .	100 amps

Procedure :

At 1700 G.M.T. URSI de IDO

Wavelength of previous day's transmission, antenna current of
present day's transmission.

From 1701-1703 G.M.T. a long dash is sent

Standard Frequency Waves.

Transmission of standard frequency waves is made by the under-mentioned stations in addition to those given above under U.R.S.I. signals.

*France.***(1) Eiffel Tower. (FL).**

On the 1st and 15th days of each month.

Standard wave = 5,000 metres.

Procedure: C.W. transmission, energy in aerial about 60 Kw.

From 1630-1631 G.M.T., a series of letter "A" thus:—

● — ● — ● — etc.

At 1631 G.M.T. Three-minute dash (5,000 metre wave).

Standard wave = 7,000 metres.

From 1640-1641 G.M.T., a series of letter "B" thus:—

— ● ● ● — ● ● ● — ● ● ● etc.

At 1641 G.M.T. Three-minute dash (7,000 metre wave)

It is impossible to ensure the transmission of rigorously exact wavelengths. Very precise measures of the waves as they are received are made in the Laboratories of the Etablissement Central de la Télégraphie Militaire in Paris, and the corrections to be applied are thus determined. The station at Lyons (see below) transmits the exact length of these waves at 1730 G.M.T.

(2) Lyons. (YN) on the 1st and 15th days of each month.

Standard wave = 10,000 metres.

Procedure: C.W. transmission (energy in the aerial about 100 Kw.).

From 1650-1651 G.M.T., a series of letter "C" thus:—

— ● — ● — ● — ● — ● — ● etc.

At 1651 G.M.T. Three-minute dash (10,000 metre wave)

Standard wave = 15,000 metres.

From 1700-1701 G.M.T., a series of letter "D" thus:

— ● ● — ● ● — ● ● etc.

At 1701 G.M.T. Three minute dash (15,000 metre wave)

CORRECTED VALUES OF THE FOUR WAVES ABOVE (*i.e.*, 5,000, 7,000, 10,000 and 15,000 metres), are transmitted by Lyons (YN), on 15,000 C.W.

Station—Lyons (YN).

Procedure: At 1730 G.M.T. a series — ● — ● — ●, followed by — ● — ● — ● — ● — (CQ) — ● — ● — ● —, letter "A" (● —) (a group of figures giving the exact wavelength of first wave, approximately 5,000 metres); letter "B" (— ● ● ●), (a group approximately 7,000 metres); letter "C" (— ● — ●) (a group approximately 10,000); letter "D" (— ● ●) (a group approximately 15,000). The whole message is sent three times in succession.

When the results of the frequency measures are not known at 1730 G.M.T. at Lyons, this station "stands by" and the message is then sent at 1800 G.M.T.

NOTE.—There are no transmissions of standard frequency waves from either station on January 1st or August 15th.

(3) Le Bourget. (FNB). Daily (Sundays excepted).

Standard wave = 900 metres (for aviation).

Procedure: At 0844 G.M.T. CQV FNB—followed by dash lasting 60 seconds—figures giving exact wavelength—AR VE.

Standard wave = 1400 metres (aviation).

At 0847 G.M.T. (as at 0844 above).

Standard wave = 1680 metres (aviation).

At 0850 G.M.T. (as at 0844 above).

UNITED STATES.

Washington, D.C. (U.S.A. Bureau of Standards station, call WWV.)

(a) The Bureau of Standards sends out at several announced times each month waves of accurately determined frequency ranging from 125 to 6,000 kilocycles (2,400 to 50 metres). The accuracy of the emitted waves is greater than 0.3 per cent. and particulars of the transmissions are published in advance in "The Radio Service Bulletin," a monthly publication of the U.S. Department of Commerce. These special signals are transmitted from two stations, WWV, the Bureau of Standards radio laboratory at Washington, D.C., and 6 XBM, Stanford University, near San Francisco, California. All transmission will be by unmodulated C.W.

The procedure adopted is as follows:—

A complete standard frequency transmission includes (1) a "general call," (2) a "standard frequency signal" and (3) "announcements."

The general call is given at the beginning of the 8-minute period and continues for about 2 minutes. This includes a statement of the frequency. The standard frequency signal is a series of very long dashes with the call letters (WWV or 6 XBM) intervening. This signal will continue for about 4 minutes. The announcements are on the same frequency as the standard frequency signal just transmitted, and contain a statement of the measured frequency. An announcement of the next frequency to be transmitted is then given. There is then a 4-minute interval while the transmitting set is adjusted for the next frequency.

All transmissions are by unmodulated continuous-wave telegraphy.

(b) The Bureau also measures the frequencies of waves emitted by broadcasting and other stations in the U.S.A. and publishes each month in the "Radio Service Bulletin" a list of stations whose frequencies have been found to be sufficiently constant to be considered as standard frequency stations.

GREAT BRITAIN.

Devizes. (GKU).

Standard wave = 2,100 metres.

The Post Office station at Devizes transmits a standard wave *daily* at 0444, 0844, 1244, 1644 and 2044 G.M.T. consisting of a prolonged dash lasting one minute. This is to enable ships to tune their instruments accurately to 2,100 metres. The standard wave will be sent towards the end of the period of 10 minutes, *viz.*, 35-45 minutes past the hour during which ships using long wave C.W. are at present required to keep watch on 2,400 metres. Devizes will ask ships to "stand by" for standard wave on 2,100 metres at 44 minutes past the hour.

Air Ministry (London). (GFA). Daily transmissions.

Standard wave = 900 metres (for aviation.)

Procedure: At 0750 G.M.T. CQ V GFA a series of figure 1 (• — — — —) for 30 secs., followed by a dash lasting 5 secs. Any correction will be indicated immediately after the dash by the repetition of the figure 1 followed by a four-figure group indicating the actual wave transmitted

Standard wave = 1,400 metres (aviation).

At 0745 G.M.T. same as at 0750 above, except that figure 2 is sent.

Standard wave = 1680 metres (aviation).

At 0800 G.M.T. same as at 0750 above, except that figure 3 is sent.

National Physical Laboratory (Teddington, Middlesex). (5 HW).
 Station particulars :

Effective height of aerial, 25 metres.

Aerial current varies from about 5 amperes at 360 kilocycles to about 2 amperes at 60 kilocycles.

Transmissions take place on *alternative* Tuesday afternoons as under :—

Time, G.M.T.	Frequency Kc/s.	Approximate Wavelength	Indicating Group
1500-1503	360	833	N1
1508-1511	280	1,072	N2
1516-1519	200	1,500	N3
1524-1527	180	1,667	N4
1532-1535	120	2,500	N5
1540-1543	100	3,000	N6
1548-1551	75	4,000	N7
1556-1559	60	5,000	N8

The programme is transmitted in the following form :—

At 14.58 G.M.T. CQ CQ CQ de 5 HW 5 HW 5 HW repeated for two minutes at a frequency of 360 kilocycles.

From 1500 to 1503—

N1 N1 N1 ████████ 20 sec. dash ████████ transmitted six times altogether.

The aerial current is then immediately transmitted on the same frequency, and is given twice. The wait signal • — • — • is then given.

Five minutes interval.

From 1508 to 1511—

N2 N2 N2 ████████ 20 sec. dash ████████ transmitted six times.

The aerial current is then immediately transmitted on the same frequency, and is given twice. The wait signal • — • — • is then given.

During the five minutes' interval short dashes will be heard whilst exact adjustment of the next frequency is being made, but they are not to be considered as part of the programme.

Transmission of Earthquake News by W/T.

(Seismological Radiotelegrams.)

It seldom happens that rapid communication of seismological observations is seriously needed, because the accurate location of an epicentre is best undertaken when all the information relating thereto is available. At present the rôle of W/T is that of providing a means of roughly checking the reliability of information in a report, which, from the records of local instruments, appears to be misleading.

(I) DETAILS OF SEISMOLOGICAL REPORTS TRANSMITTED BY THE EIFFEL TOWER (FL).

These reports give information regarding earthquake disturbances registered by the seismographs at the Geophysical Observatory at Strasbourg, or transmitted thereto by any of the co-operating seismological observatories at Algiers, Athens, Barcelona, Brussels, Coimbre, Oxford, Paris, Rome, Zurich and Wei-hai-Wei (China).

The Eiffel Tower transmits *daily* (except on the days following public holidays) a seismological radio telegram.

Each of these messages is repeated three times :

(a) after the Synoptic Weather Report for France transmitted at 1420 G.M.T. on 7,300 C.W.

(b) after the European Synoptic Report at 1600 G.M.T. on 7,300 c.w.

(c) after the European report transmitted at 1,005 G.M.T. on 2,600 sp.

It sometimes happens that because of the late arrival of the seismological data at the station, reports cannot be sent out immediately after the 1420 and 1600 messages. They are then transmitted on 7,300 C.W. after the meteorological radio messages at 1900 and 2100 G.M.T.

In all cases the approximate energy in the aerial is 60 kw.

Form of Message.

There are three forms of report varying with the nature and extent of the disturbance :—

- (a) Reports giving information regarding slight movements of the earth's crust or quakes of very feeble intensity. These reports are preceded by the words "Sismo Strasbourg," followed by a message *en clair* (in French) giving the particulars.

Example : "Sismo Strasbourg" le 28 mai, longues ondes vers 20h. 12m., maximum NS, 20h. 26m. Séisme lointain 21h. 05m., 46s.; maximum 21h. 44m.

- (b) The message also frequently gives particulars of micro-seismic disturbances. These minute disturbances may be due to the passage of atmospheric depressions over the land or the breaking of waves against the cliffs or a combination of the two causes. Reports from other French observatories are often included.

Example : "Sismo Strasbourg" du 6 ou 7 juin, agitation croît légèrement. Briançon signale secousse du degré 4, durée 2 secondes à 8h. 20m.

- (c) Important earthquake disturbances are transmitted in the following code :—

ddaa pp phhmm ssttt D₁D₁DDD.

where the symbols have the following meanings :—

dd = day of month.

aa = azimuth of epicentre from 10° to 10° counting from N. through E (01-36), based on any *clear* indications of the trace on the seismograph(s). The addition of 50 (*i.e.*, figures 51-86) indicates that the azimuth is uncertain by $\pm 180^\circ$. The figures 91-98 are used to indicate that the direction is vague and estimated only to the nearest 45°; 99 means that no azimuth determination has yet been made; 00 that it seems impossible.

pp = refer to phases, P being the primary wave (code figures 1-4) and S the secondary wave (code figures 5 to 8).

	1	2	3	4
Phase P	iP very clear trace of P waves	P and \bar{P} clear	P clear	eP beginning badly defined on trace.
	5	6	7	8
Phase S	iS very clear trace of S waves	S clear	eS beginning badly defined on trace	uncertain

For disturbances near at hand (*i.e.*, when the epicentre is less than 700 km. distant), waves represented by the symbol \bar{P} are noted. These waves travel in a different layer of the earth's crust from P waves and less rapidly. The figure 9 for either P or S indicates that the minute signal interferes with the beginning (the pen which makes the trace on the recording ribbon being out of contact at this moment).

hh, mm, ss are the hours, minutes and seconds of the beginning of P.
 tt is the difference in seconds of the times of arrival of the S and P waves, *i.e.*, (S — P) in sec.

D_1D_1 is the difference (\bar{P} — P) in seconds for close earthquakes; if this difference is not clear on the trace, D_1D_1 is replaced by 99.

DDD is the distance in kilometres for close earthquakes.

D_1D_1DDD is the distance in kilometres for distant quakes.

NOTE.—The region of the epicentre is given *en clair* whenever possible together with an indication of the intensity of the disturbance.

Example:—20991 50051 33393 04830 Turkestan.

Translation: Disturbance on the 20th, azimuth of epicentre not yet determined, iP, iS beginning at oh, 51m. 33s., difference S-P = 393 sec.; distance 4,830 km.; epicentre Turkestan.

(II) REPORTS TRANSMITTED BY BORDEAUX (LY).—

Important seismological radio-telegrams (*i.e.*, those in code (c) above) are repeated by Bordeaux on a wavelength of 23,450 C.W., at the conclusion of the scientific T.S. (rhythmic beats) at 2,000 G.M.T.

(III) REPORTS TRANSMITTED BY ZIKAWEI OBSERVATORY (near Shanghai, China) FFZ, 750 sp.

In cases where a strong shock has been registered by the instruments of the Zikawei Observatory, a Seismological Bulletin will be issued immediately after the weather forecast at 0300, 0900, 1400, 1800 G.M.T. in the same code as for Eiffel Tower reports (International Code) giving the G.M.T. of the arrival of the P and S waves and followed by the distance and position of the epicentre according to the Zikawei data.

Ship Distress Signals.

TRANSMISSION OF DISTRESS SIGNALS: SUPPLEMENTARY INSTRUCTIONS.

The Distress Signal (SOS) may fail to arrest the attention of watchers when it is made at the normal rate of signalling

- (1) in congested areas,
- (2) at very long ranges on the high seas, and
- (3) when interference is experienced from atmospheric.

Experience indicates that the prolonged dashes (TTT), which are used when transmitting the Safety Signal laid down by the Safety of Life at Sea Convention, are distinctive even when heard in conjunction with other signalling, and if special stress is given to the three dashes (O) in the Distress Signal the difficulty experienced by watchers will be obviated or at least reduced.

The first signal (• • • — — — • • •) should therefore be transmitted for one minute at a rate of about five words per minute (equivalent to about eight repetitions of • • • — — — • • • per minute), special attention being given to the sending of long clear dashes.

The attention of operators is also called to the great importance of obtaining an absolute cessation of all other signalling in the region of the distress signal at the earliest possible moment. The greatest discretion and brevity should be used when repeating a distress call, or in asking or giving information regarding it.

Country and Station.	Call.	Lat.	Long.	Wave.	Hours of Watch.
(1)	(2)	(3)	(4)	(5)	(6)
CANADA (Nova Scotia)					
Lurcher Light-vessel ..	VDR	43° 48' N.	66° 32' W.	600 sp.	First half of every odd hour from 0700-1930 inclusive and from 2200-2230 Eastern Standard Time (Long. 75° W.) Continuous watch is kept during the season of navigation
Heath Point Light-vessel ..	VCI	49° 03' N.	61° 30' W.	600 sp.	
DENMARK					
Graadyb Light-vessel ..	OUX	55° 20' N.	8° 05' E.	600 sp.	Continuous watch
Horns Rev Light-vessel ..	OUZ	55° 34' N.	7° 19' E.	600 sp.	
Vyl Light-vessel ..	OUY	55° 22' N.	7° 41' E.	600 sp.	
Skagens Rev Light-vessel ..	OUB	57° 46' N.	10° 44' E.	600 sp.	
Laesø Trindel Light-vessel..	OUT	57° 28' N.	11° 20' E.	600 sp.	
Laesø Rende Light-vessel ..	OUK	57° 13' N.	10° 42' E.	600 sp.	
Anholt-Knob Light-vessel ..	OUR	56° 46' N.	11° 52' E.	600 sp.	
Gilleleje Flak N. Light-vessel	OUE	56° 10' N.	12° 18' E.	600 sp.	
Gjedser Rev Light-vessel ..	OOU	54° 27' N.	12° 11' E.	800 sp.	
Gjedser Havn ..	OXD	54° 32' N.	11° 56' E.	250 sp.	
FRANCE					
Lorient-Pen Mané ..	FUN	47° 44' N.	3° 21' W.	600 sp.	Continuous watch

GERMANY**BROADCASTING OF DISTRESS SIGNALS.**

Signals of distress are to be transmitted at a speed of about 10 **words per minute**, during the first minute, and repeated at the same speed when necessary.

In case of atmospheric disturbances being prevalent at the time of signalling, it is preferable to transmit at a greater speed, not to exceed 20 **words per minute**.

When the signals have to traverse a considerable distance, due either to the vessel being out of the regular track of shipping or to the nearest W.T. coast station being a long distance off, transmission should be reduced to a speed of 5 **words a minute**, taking particular care to make each dot and dash distinctly. This reduced speed is of course subject to there being no atmospheric disturbance rendering the signals liable to interruption.

(1)	(2)	(3)	(4)	(5)	(6)
Elbe No. 1 Light-vessel ..	KBF	54° 00' N.	8° 15' E.	600 sp.	Continuous watch
Elbe No. 3 Light-vessel ..	—	—	—	—	

GREAT BRITAIN**DISTRESS SIGNALS: BROADCASTING.**

The British Government have recently had under consideration the question of improving the existing arrangements as regards the employment of wireless signals of distress by ships at sea.

A large number of ships equipped with W/T carry one experienced operator only, who usually keeps watch for a period of eight hours daily. During the remainder of the day, watch is kept by someone who is generally not skilful enough to distinguish W/T signals either when simultaneous emissions are taking place at different stations, or in the case of atmospheric disturbances. Even an experienced operator sometimes finds the latter difficult to contend with.

Instructions have therefore been issued to the effect that on board a vessel in distress the call SOS (• • • — — — • • •), and subsequent repetitions thereof, shall be transmitted at a speed equivalent to about five words per minute.

The same signal is also used by aircraft in distress or requiring assistance.

(In publishing this information the Bureau International de l'Union Télégraphique, Berne, states that it has also been adopted by the following countries:—

Norway, Mexico, Latvia, Sweden, Esthonia).

RECEPTION OF DISTRESS SIGNALS: PROCEDURE.

On receipt of a distress signal (SOS) all signalling is at once to cease and every effort made to assist the signal through to its destination.

If the distress signal is addressed to a particular station, and another station intercepting it finds that the station to which it is addressed has difficulty in dealing with it, the second station should do all in its power to give effect to the call.

Arrangements have been made with the General Post Office for advising Naval Authorities where distress signals are received by W/T stations belonging to the General Post Office.

The following stations deal with the reception and transmission of signals from vessels in distress locally:

Station.	Call	Lat.	Long.	Wave.
Tongue Light-vessel	GVF	51° 30' N.	1° 23' E.	230
Gull Light-vessel	GVC	51° 16' N.	1° 29' E.	230
East Goodwin Light-vessel	GVB	51° 13' N.	1° 36' E.	230
South Goodwin Light-vessel	GVD	51° 09' N.	1° 28' E.	230
Cross Sand Light-vessel	GVA	52° 38' N.	1° 56' E.	230
Sunk Light-vessel	GVE	51° 52' N.	1° 37' E.	230

MISUSE OF DISTRESS SIGNAL.

The attention of the Board of Trade and the Postmaster-General has been called to cases in which the wireless distress signal has been sent out by ships (including British ships) which were not at the time in immediate danger.

The signal SOS (● ● ● — — — ● ● ●) is prescribed by the International Radiotelegraph Convention as the signal to be used by *ships in distress* and under the international regulations, which all ships fitted with wireless telegraph apparatus must obey, stations hearing the distress signal must suspend all ordinary correspondence until the call has been dealt with.

Masters of ships are under international obligation to render assistance to every person in danger of being lost at sea.

The sending out of the distress signal seriously interrupts wireless telegraph traffic and results in ships being diverted from their course and delayed. It must accordingly be used only when the ship is in immediate danger and urgently in need of help. Misuse of the signal will inevitably lead to its being ignored in a case of real necessity.

Full particulars of any well authenticated case of misuse should be reported to the Board of Trade or the General Post Office, London.

REGULATIONS REGARDING DANGER AND DISTRESS SIGNALS TO BE OBSERVED BY BRITISH SHIPS.

1. All ships must suspend the Wireless communication on which they may be engaged for three minutes every half-hour at 15 minutes and 45 minutes past each hour G.M.T. and listen out for Distress Calls and the Danger Signal on 600 metre wave. During this period no transmission is to take place on the 600 metre wave except Distress Calls, messages relating to Dangers to Navigation, and messages directly arising therefrom.

2. A wave of 2,400 metres has been adopted for British ships as the long C.W. listening wave.

In general this wave shall be used for C.W. communication between mobile stations.

During their scheduled hours of service ship stations equipped for long C.W. working shall listen on the wave of 2,400 metres for 10 minutes between 35 minutes and 45 minutes past each hour G.M.T. During this period (*e.g.*, 0235 to 0245, etc.) stations which have messages for ship stations will call up these ship stations on 2,400 metres and arrange time, and, if necessary, wavelength upon which communication shall take place. The wave of 2,400 metres is not to be used for any other purpose during these periods with the exception of distress messages sent as in (5).

3. During the scheduled hours of watch, or service, except at such times as the ship is actually communicating on another wave or is expecting to receive a communication on another wave, watch must be kept on 600 metres.

4. Any ship receiving a "Distress Call" should acknowledge it as soon as possible, taking care not to interfere with other ships which are likely to be acknowledging at the same time.

The operator is at once to inform the master of the vessel that he has received the "Distress Call" and whether or not he has been able to acknowledge it, he is also to inform the master of the vessel whether or not he has heard any other ships acknowledging the "Distress Call" and what their relative positions are, if they have given them. He will then receive the master's instructions as to the action (if any) which he is to take with regard to the repetition of the "Distress message" on 600 metres.

5. Ships fitted with C.W. apparatus should, under the above conditions, also repeat the "Distress Message" on any C.W. waves which they may know to be in use in the neighbourhood at the time, on receipt of instructions from the master to do so.

Operators on board all British ships are required to give effect to Article II of the Regulations for the safety of Navigation.

The Safety Signal (— — —) is frequently referred to as the "Danger Signal" or the "Alarm Signal". Generally speaking this signal is the general alarm for all stations concerned in the service of mobile stations, and its use is confined to the 600 metre wave.

On hearing the "Safety Signal" the operator or watcher on duty is at once to take the necessary steps to insure the reception of the Safety Message and to inform the master of the vessel.

ITALY

In order to secure, with the greatest possible certainty, the picking up of signals of distress from ships at sea, all Naval and Coast W/T stations on the coasts of Italy and the Italian Colonies, which are available for the use of the 600 metres wave, should discontinue transmission from 15 m. to 18 m., and from 45 m. to 48 m. of every hour (Standard Time), listening-in with particular attention during these intervals on the 600 metres wave for signals from ships in distress.

Country and Station.	Call.	Lat.	Long.	Wave.	Hours of Watch.
(1)	(2)	(3)	(4)	(5)	(6)
ITALY					
Spezia	ICS	44° 06' N.	9° 49' E.	600 sp.	0400-0420, 0600-0620, 1500-1520, 1600-1620, G.M.T.
Genoa	ICB	44° 26' N.	8° 56' E.	600 sp.	At times other than those given for Spezia above
NEW ZEALAND					
Awanui	VLA	34° 54' S.	173° 18' E.	600	Continuous watch
Auckland	VLD	36° 51' S.	174° 46' E.	600 sp.	Continuous watch
Wellington	VLW	41° 16' S.	174° 46' E.	600 sp.	Continuous watch
Awarua	VLB	46° 30' S.	168° 23' E.	600	1830-0830 G.M.T. From May 1st to October 31st the times are 1830- 0630 G.M.T.

UNITED STATES OF AMERICA. VESSELS IN DISTRESS.

The United States Coast Guard Service is always ready to render any assistance to vessels in distress or to remove obstructions. The W/T stations given in the following schedule will transmit messages to the necessary

authorities; or the master of the vessel may be able to communicate with one of the Coast Guard cutters either direct or through a U.S. Naval W/T station.

Should a master who has requested assistance find that his vessel is able to proceed with safety and does not require assistance, a message to that effect should be promptly sent.

NOTE.—In future, ships should use a wavelength of 706 metres (spark) when communicating with United States coast stations, and *vice versa*.

Owing to broadcasting in that country being carried out on wavelengths from 300 to 600 metres, and the use hitherto by ships of wavelengths of 300, 450 and 600 metres, the transmission of messages has become congested, causing trouble and delay.

If ships are equipped so as to have the optional use of the 706 metres wave, wireless communication with United States coast stations will be facilitated.

SANDWICH (HAWAIIAN IS.), ALASKA & U.S. PACIFIC COAST.

The territories mentioned are divided into two divisions, viz.:—the Northern Division and the Southern Division.

The Southern Division extends from Cape Blanco, Oreg., to the Mexican border, and has its headquarters at San Francisco.

The Northern Division covers the remainder.

If the Coast Guard cutters cannot be communicated with direct, the messages should be transmitted to the nearest U.S. Naval W/T station.

UNITED STATES (GULF AND ATLANTIC COASTS)

Station	Call	Latitude Longitude	Wave	Notes
Key West, Fla.	NAR	24° 33' N. 81° 48' W.	600 sp.	The Gulf Coast Guard Division, with headquarters at Key West, extends from Cape Canaveral to the Rio Grande. The W/T stations mentioned are available for vessels requiring assistance.
Jupiter, Fla. . .	NAQ	26° 57' N. 80° 05' W.	600 sp.	
St. Augustine, Fla.	NAP	29° 53' N. 81° 17' W.	600 sp.	
Charleston, S.C.	NAO	32° 52' N. 79° 58' W.	600 sp.	The Norfolk Coast Guard Division, with headquarters at Norfolk. Vessels requiring assistance, passing derelicts or other obstructions between Lat. 38½° N. and 27° N., are requested to forward full information, including date, time, and the latitude and longitude of the position.
Morehead City, N.C.	NAN	34° 43' N. 76° 44' W.	600 sp.	
Norfolk, Va. . .	NAM	36° 50' N. 76° 18' W.	600 sp.	
Hog I., Va. . .	NCZ	37° 23' N. 75° 43' W.	800 sp.	Sixth Coast Guard District.
Bethany Beach, Del.	NSD	38° 33' N. 75° 03' W.	800 sp.	
Cape Henlopen, Del.	NSD	38° 48' N. 75° 05' W.	800 sp.	
Cape May, N.J.	NSD	38° 56' N. 74° 55' W.	800 sp.	
New York . . .	..	.. ..	600 sp.
Newport, R.I.	NAF	41° 35' N. 71° 17' W.	600 sp.	Eastern Coast Guard Division, with headquarters at Boston.
Boston, Mass.	NAD	42° 21' N. 70° 57' W.	600 sp.	
Bar Harbour, Me.	NBD	44° 14' N. 68° 18' W.	600 sp.	

Aircraft.

Information with regard to Distress Signals by Day and Night.

Mariners and others are notified that when any aircraft is in distress and requires assistance, the following shall be the signals displayed by her, either together or separately:—

- I. The International Signal "S.O.S." by means of visual or Wireless Telegraphy.
- II. The International Code Signal of Distress indicated by N.C.
- III. The Distant Signal, consisting of a square flag having above or below it a ball or anything resembling a ball.
- IV. A continuous sounding with any sound apparatus.
- V. A signal consisting of a succession of White Very's lights, fired at short intervals.
- VI. A white flare from which at intervals of about 3 seconds a white light is ejected into the air.

NOTE.—The above signals are subject to such modification as shall be published from time to time.

Wireless Navigational Warnings to Airmen.

Information of a specially urgent nature concerning aerial navigation *e.g.*, warning regarding the discontinuation of navigational aids or obstruction of landing areas at aerodromes, will be broadcast by W/T from the Air Ministry Station (GFA), in addition to being promulgated in the usual manner. Such notices issued by W/T will be added at the end of the Air Ministry synoptic weather reports transmitted on a wavelength of 4,100 m. C.W. at any of the following times (G.M.T.) daily:—

0600, 0800, 1400, 1900.

Medical Advice

Country and Station.	Call.	Wave.	Notes.
DENMARK			
Blaavand	AXB	600 sp.	Vessels at sea, whatever their nationality, may obtain medical advice by wireless free of charge in case of illness or accident on board, through Blaavand or Copenhagen W/T stations. The master of the vessel requiring advice should transmit to one of the stations mentioned a message (either in Danish, Norwegian, Swedish, German, English or French) giving a brief description of the symptoms or injuries. This will immediately be forwarded to the Communal Hospital, Esbjerg, or the Seamen's Hospital, Copenhagen, the doctors from which will despatch the necessary advice direct to the ship. All messages are transmitted free of charge.
Copenhagen	OXA	600 sp.	
FAROE ISLANDS			
Thorshavn	ONJ	600 sp.	Medical advice to seamen can be obtained from the County Hospital (Queen Alexandrines Hospital) at Thorshavn. The request for medical advice should be sent in plain language, Danish, English, French or German and the telegraphic transmission as well as the medical advice are given free of charge.
SWEDEN			
Göteborg	SAB	600	Arrangements have been made, in co-operation with the Telegraph Department and the hospital authorities at Göteborg, whereby vessels at sea, of any nationality, may receive free medical advice in the event of illness on board. The master of a vessel requiring such advice should transmit, in Swedish, English, French or German, a short message to Göteborg W/T station, describing the sickness, which will be forwarded by telegram to the Göteborg public hospital. The hospital will supply advice, which will be sent by wireless from the W/T station to the vessel in question. No charge will be made for this service.

UNITED STATES, ATLANTIC AND PACIFIC COASTS AND MEXICO.

Through the co-operation of Radio shore stations with the United States Public Health Service, free medical advice for ships at sea is now available through the under-mentioned coast W/T stations on the Atlantic and Pacific Coasts of the United States and the Gulf of Mexico.

W/T Stations.	Call Signal.	Position : Latitude, - Longitude.	Hospitals
Chatham, Mass.	*WCC	41° 43' N.	U.S. Marine Hospital No. 2 Boston
Chatham, Mass.	**WIM	70° 46' W.	(Chelsea), Mass.
New York City, N.Y. . .	WNY	49° 39' N. 74° 00' W.	U.S. Marine Hospital No. 70, 67 Hudson Street, New York City. Alternatively: U.S. Marine Hospitals Nos. 21 (Stapleton, S.I.N.Y.), and 43 (Ellis Island, N.Y.).
San Francisco, California (Bolinas)	KPH	37° 54' N. 122° 42' W.	U.S. Marine Hospital No. 19 Fourteenth Avenue and Lake St. San Francisco, Calif.
Key West, Florida (Re- ceiving) (Transmitting)	NAR	24° 34' 05" N. 81° 45' 03" W. 24° 33' 22" N. 81° 48' 21" W.	U.S. Marine Hospital No. 10, Front and Emma Streets, Key West, Florida
U.S. Naval Station, Algiers, La.	NAT	29° 52' 50" 90° 2' 18"	U.S. Marine Hospital No. 14, New Orleans, La. Henry Clay and Tchoupitoulas Sts.
Tuckerton, N.J.	WSC	39° 33' 0" 74° 23' 0"	U.S. Marine Hospital No. 70, 67 Hudson Street, New York City. Alternatively: U.S. Marine Hospitals Nos. 21 (Stapleton, S.I.N.Y.) and 43 (Ellis Island, N.Y.)

* Long distance continuous wave. NOTE: All stations use 600 metre wave.
**Short distance.

Ships desiring medical advice can secure prompt service by communicating with any of the above mentioned W/T stations. The message is to be signed by the master of the vessel, and should state briefly the symptoms of the person afflicted.

The reply containing the medical advice given by the hospital consulted will be sent in plain language (English) and so phrased as to be intelligible to a layman.

This free medical service has been established primarily for the benefit of ships not carrying physicians; however, should occasion arise, wireless consultation may be held by ships' physicians with the hospital staffs through the W/T stations referred to.

Free Medical Advice by Radio.

The United Fruit Co. has established a free medical radio service from its hospitals in the various countries of Central America and from its passenger steamers to all ships at sea. So far as the United Fruit Co. and its subsidiary companies are concerned, this service is available without charge to ships of all nationalities through the following radio stations operated by the United Fruit Co. or the Tropical Radio Telegraph Co.:

Free Medical Advice by Radio—continued.

Country and Station.	Call.	Lat.	Long.	Wave.
UNITED STATES (Gulf Coast)				
New Orleans	WNU	30° 00' N.	90° 06' W.	600
Burrwood, La. .. .	WBW	28° 58' N.	89° 23' W.	600
Fort Morgan, Ala. .. .	WIO	32° 00' N.	87° 00' W.	600
HONDURAS				
Swan Island (Caribbean Sea) .. .	US	17° 24' N.	83° 57' W.	600
Tela .. .	UC	15° 47' N.	87° 30' W.	—
Puerto Castilla .. .	UA	16° 01' N.	86° 02' W.	—
Tegucigalpa .. .	UG	14° 14' N.	87° 09' W.	—
COSTA RICA				
Port Limon .. .	UX	10° 00' N.	83° 03' W.	—
PANAMA				
Almirante .. .	UB	9° 20' N.	82° 17' W.	—
COLOMBIA				
Santa Marta .. .	UJ	11° 15' N.	74° 14' W.	600 reception 2,200 trans- mission

Radiograms requesting medical advice should be signed by the captain of the ship and should state briefly, but clearly, the symptoms of the person afflicted. Such radiograms should be addressed "Unifruitco" (name of place), and may be sent to any of the United Fruit Co.'s hospitals listed below:

Santa Marta, Colombia.	Tela, Honduras.
Port Limon, Costa Rica.	Puerto Castilla, Honduras.
Almirante, Panama.	Puerto Barrios, Guatemala.

All the United Fruit Co.'s passenger steamers carry doctors, and free medical service may be secured by radio from any of them by a radiogram addressed "Ship's doctor," followed by the name of the steamer.

This free medical advice is established primarily for the benefit of ships not carrying doctors; however, should occasion require, ship's doctors may hold consultation by radio with the United Fruit Co. ships' doctors and hospital staffs.

The physicians and surgeons comprising the medical staff of the United Fruit Co. and its subsidiaries are thoroughly qualified, but in view of the fact that radio medical advice to ships at sea is given free, and without an opportunity for a personal examination of the patients by them, no responsibility will be assumed by either the company and its subsidiaries or the physicians or surgeons giving the advice as to its accuracy, or for error in the receipt or transmission of any messages sent or received in connection therewith.

It is requested that, when sending medical advice radiograms, radio operators check them " (number of words) DH Medico."

"D.H. Medico" radiograms will be given preference over all other radiograms, excepting SOS calls, throughout the radio service of the United Fruit Co. and subsidiary companies.

Fog Signals.

A vessel equipped with a radio compass may determine its bearings from these stations, although they may not be visible, and may also obtain the bearing of another ship equipped with radio.

The track of a radio wave is approximately a great circle; in plotting bearings, therefore, taken at a considerable distance, on a chart of the Mercator projection, it must be remembered that the line of bearing is not a straight line excepting on the meridian.

In the case of submarine fog signals which are operated simultaneously with W/T fog signals, the distance of the ship from the light-vessel may be calculated approximately by observing the interval of time which elapses between the reception of these signals, either at the beginning or the end. This should be done by allowing 1,625 yards (1,486 metres) for each second that the submarine fog signal is heard after the W/T fog signal.

Country.	Call.	Wave-length.	Normal range.	Signals.	Period
(1)	(2)	(3)	(4)	(5)	(6)
CANADA INCLUDING NEWFOUNDLAND					
Heath Point Lt. V. (8 mi. 104° from Heath Point Lat. 49° 03' 00" N. Long. 61° 30' 30" W.	VCI	1,000 spk.	50 mi.	Groups of ---- (four dashes) for .. Silent	60 sec 4 min
Lurcher Lt. V. off Lurcher Shoal. Lat. 43° 49' 30" N. Long. 66° 32' 00" W.	VDR	1,000 spk.	50 mi.	Groups of •---- (one dot and three dashes) for Silent Limited watches maintained on 600 m. See under "Meteorological" section.	2 min 3 min
Sambro Outer Bank Lt. V. Lat. 44° 20' 25" N. Long. 63° 30' 19" W.	VCX	1,000 spk.	50 mi.	Groups of ---- (four dashes) for .. Silent	2 min 3 min
Seal Island, N.S. Lat. 43° 23' 28" N. Long. 66° 00' 53" W.	VAL	1,000 spk.	50 mi.	Groups of ••---- (two dots and two dashes) for Silent Operator carried at this station. Ships desiring to communicate should enquire from VAU or VCU for watches kept by him.	2 min 3 min
Cape Bauld, Newfoundland Lat. 51° 38' 41" N. Long. 55° 25' 03" W.	VCZ	1,000 spk. ¹	50 mi.	Groups of —•---- (dash, dot and two dashes) for Silent	60 sec 1½ min
Cape Ray, Newfoundland Lat. 47° 37' 02" W. Long. 59° 18' 20" W.	VCR	1,000 spk.	50 mi.	Groups of ---- (three dashes) for .. Silent	60 sec 4 min
NOTE.—All the above Radio Beacon Stations operate continuously during foggy weather.					



Country.	Call.	Wave-length.	Normal range.	Signals.	Period.
(1)	(2)	(3)	(4)	(5)	(6)
DENMARK					
Gjedser Rev. Lt. V. ... Lat. 54° 27' 12" N. Long. 12° 11' 03" E.	OUU	800 spk.	12 mi.	<p>(a) W/T Signal</p> <p>— — — — — • • • • • (Morse letters GR, followed by 12 dots at intervals of 1·3 sec.) for 20 sec.</p> <p>Silent 40 sec.</p> <p>NOTE.—The interval between two successive dots corresponds to the time taken for sound to travel a distance of 1 mile through water approx.).</p> <p>(b) Submarine Oscillator</p> <p>The submarine bell will sound two strokes every 20 sec., thus:—</p> <p>Stroke for 3 sec.</p> <p>Silent 1½ sec.</p> <p>Stroke 3 sec.</p> <p>Silent 12½ sec.</p>	

The wireless fog-signal will be made every minute, the last dot of the characteristic — — — — • • — — (i.e. the last dot of the letter R) being sent simultaneously with the commencement of the third stroke of the submarine bell.

The number of the dot (1—12) which coincides with the sound of the bell is the distance of the light-vessel in miles (approximately). Thus, if the tenth dot is received simultaneously with the beginning of the third stroke of the submarine bell, the distance is ten miles.

By observing the time of the coincidence of the two signals a ship will be able to determine approximately her distance from the light-vessel when this is 12 miles, or less, in addition to obtaining the bearing when D/F apparatus is installed on board.

NOTE.—The wireless fog signal is not in operation when the station is required for ordinary telegraphy.

(1)	(2)	(3)	(4)	(5)	(6)
Graa Dyb Lt. V. ... Lat. 55° 20' 00" N. Long. 8° 04' 41" E.	OUX	600 spk.	12 mi	<p>(a) W/T Signal</p> <p>— — — — — • • • • • (Morse letter G, followed by 12 dots at intervals of 1·3 sec.) for 18·6 sec.</p> <p>Silent 41·4 sec.</p> <p>(b) Submarine Oscillator</p> <p>The submarine bell will sounded be three times every 20 sec.</p>	

The wireless fog-signal is transmitted every minute, the dot of the characteristic — — — — • being sent simultaneously with the first stroke of the fog bell. The number of dots (one to twelve) received when the sound of the submarine bell coincides is the distance of the light-vessel in miles (approximately). Thus, if the tenth dot is received simultaneously with the first stroke of the submarine bell, it is equivalent to 10 miles.

NOTE.—The W/T fog-signal is not in operation when the W/T station is required for ordinary telegraphy.

By observing the time of the coincidence of the two signals ships are able to determine approximately the distance of the light vessel when this is 12 miles, or less, in addition to obtaining the bearing.

(1)	(2)	(3)	(4)	(5)	(6)
FRANCE					
Cap Gris Nez Lighthouse Lat. 50° 52' 10" N. Long. 1° 35' 04" E.	—	1,000 r.c.w.	—	<p>Wireless fog signals (experimental) will be transmitted continuously during foggy weather, consisting of the emission of signals producing in the telephone the musical note G, rhythmically, thus:—</p> <p>— — — — — • — — — — — • — — — — — • etc. for 15 sec.</p> <p>— — — — — • — — — — — • — — — — — • etc. 30 sec.</p> <p>— — — — — • — — — — — • — — — — — • etc. 15 sec.</p> <p>Silent 30 sec.</p> <p>— — — — — • — — — — — • — — — — — • etc. (5 repetitions of the Morse letter O), during 15 sec.</p> <p>Silent 30 sec.</p> <p>NOTE.—Signalling is effected by transmitting the musical note "C" one octave above middle "C" of the pianoforte (522 double vibrations per sec.). These signals are transmitted at regular intervals.</p>	
Quessant (Créac'h Pt. Lighthouse) Lat. 48° 27' 36" N. Long. 5° 07' 48" W.	—	120	20 mi.		

Country.	Call.	Wave-length.	Normal range.	Signals.	Period.
(1)	(2)	(3)	(4)	(5)	(6)
FRANCE—contd.					
Ile de Sein Lighthouse.	—	120	20 mi.	<p>● ● ● ● ● ● ● ● ● ● etc. (10 repetitions of the Morse letter S), during 13 sec.</p> <p>Silent 27 sec.</p> <p>NOTE.—Signalling is effected by transmitting the musical note "G" one octave above the "G" next above the middle "C" of the pianoforte (783 double vibrations per sec.).</p> <p>These signals are transmitted at regular intervals</p> <p>● ● ● ● ● ● ● ● ● ● etc. (groups of 4 dots) lasting 15 sec.</p> <p>— — — — — etc. 30 sec.</p> <p>● ● ● ● ● ● ● ● ● ● etc. 15 sec.</p> <p>Silent 30 sec.</p>	
Le Havre Light Vessel	—	1,000	—		
Lat. 49° 31' 55" N.		I.C.W.			
Long. 0° 09' 36" W.					
GERMANY					
Borkum Riff Lt. V.	KBR	1,000	50 mi.	<p>Wireless fog signals (experimental), for the determination of a ship's bearing and distance from the light-vessel, are automatically transmitted during fog or mist in conjunction with the submarine sound transmitter. The signals are also sent on request.</p> <p>(a) W/T Signals.</p> <p>The transmission of W/T fog signals begins at the 20th, 36th, and 52nd minute of every hour, each period covering 8 mins., thus:—</p> <p>57 dashes (— — — — — etc.) each of 0.31 sec. duration for 26.5 sec.</p> <p>Silent 3.5 sec.</p> <p>The above repeated 5 times followed immediately by — — — — — for 6.5 sec.</p> <p>15 dots (● ● ● ● ● etc.) each of 0.1 sec. duration for 18.8 sec.</p> <p>Silent 4.7 sec.</p> <p>The above repeated 3 times.</p> <p>(This whole series of signals is sent twice in succession).</p> <p>TOTAL DURATION 8 min.</p> <p>(b) Submarine Oscillator</p> <p>The submarine sound transmitter signals the letters BR (— — — — — ● — — — — —) eight times every four minutes, commencing at 6.5 sec. after every-fourth minute of the hour (0, 4, 8, 12, &c.), thus:—</p> <p>— — — — — ● — — — — — for 8.4 sec.</p> <p>Silent 21.6 sec.</p> <p>TOTAL DURATION 4 min.</p>	
Lat. 53° 46' 12" N.		c.w.			
Long. 6° 04' 12" E.					

In order to determine the bearing the first half of the W T signals is used. As will be seen above this consists of five series of 57 dashes (— — — — — etc.) each dash of 0.31 sec. duration, with intervals of 0.14 sec., which continue for about 2½ min., each series being separated by an interval of 3½ sec. The observation is made with the ship's D F apparatus, by which means the bearing of the light-vessel can be determined.

For the determination of distance the second part of the W T signals is used in conjunction with the signals of the submarine sound transmitter. The first dash (— — — — —) of the latter (— — — — — ● — — — — —) is transmitted simultaneously with the final dot (●) of the W T signal (— — — — — ● — — — — —). This is followed by 15 dots (● ● ● ● ● etc.), and when any dot coincides with the beginning of the first dash of the submarine sound signal on receipt on board its number in the series is the distance of the light-vessel in miles, when less than 15 miles. The second part of the W T signal comprises three series. The time occupied by any dot and its interval is 1.253 sec., approximately equivalent to the time taken for sound to travel through water one sea mile. Distances above 15 miles can also be calculated by this method if the times of the subsequent signals are correctly noted.

If a ship requires the W T and submarine sound signals for the determination of bearing and distance at times other than during fog, the light-vessel should be called on the 600 metres wave (spark) during the hours of W T watchkeeping, viz.: 0700—2200, G.M.T. Outside these hours and when within a range of 20 miles or less, the light-vessel can be called by transmitting a prolonged dash of 30—35 sec. duration on 600 metres, which puts in operation the automatic receiving device which has been installed for this purpose and also for distress calls. For this service, the following special signals must be used:—

QTM = Request transmission of W/T fog signals for determination of bearing (i.e., the first part of the W/T fog signals).

QTO = Request transmission of submarine sound signals and W T fog signals for the determination of distance (i.e., in this case the second part of the W/T fog signals is referred to).

In the case of QTO, transmission will commence at the scheduled time the first fog signal is due following the time of the call; and the signals are continued for two hours unless otherwise ordered.

If the submarine sound transmitter fails, the submarine bell will be substituted, giving the same characteristics as heretofore.

Masters of ships are requested to use these signals as frequently as possible in order to gain experience as to their accuracy and reliability, and are requested to report the results to the Wasserbouant, Emden.

Country.	Call.	Wave-length.	Normal range.	Signals.	Period.
(1)	(2)	(3)	(4)	(5)	(6)
GREAT BRITAIN					
Inchkeith (Firth of Forth) Lat. 56° 02' 11" N. Long. 3° 08' 09" W.	— —	4½ to 6	10 mi.	<p>Wireless fog signal (experimental). Signalling is effected by means of a wireless transmitter and wireless reflector, the whole apparatus revolving so as to enable a ship to fix her position by bearing when within a 10 miles radius.</p> <p>The reflector makes a complete revolution once every two minutes, and a distinctive signal is sent for every half-point of the compass. This should enable the bearing of the transmitter to be determined within a quarter-point of the compass.</p> <p>The exact time of the maximum signal is not easy to determine by ear, but the times of starting and vanishing are easy to determine, as the rate of rise and fall of the signals is extremely rapid. The mean of these times gives the exact bearing of the ship in relation to the transmitting station.</p>	

Diagram of distinctive Signals sent by the Inchkeith Reflector.



(1)	(2)	(3)	(4)	(5)	(6)
HOLLAND					
Maas Lightvessel Lat. 52° 01' 39" N. Long. 3° 53' 52" E.	—	450	—	<p>(a) W/T.</p> <p>Two dashes sent out every 20 sec.</p> <p>Particulars: Dash 3 sec.</p> <p>Silence 1 sec.</p> <p>Dash 3 sec.</p> <p>Silence 13 sec.</p> <p>(b) Submarine Oscillator</p> <p>Two strokes sent out every 20 secs. Particulars as for (a) above.</p> <p>NOTE.—Both the wireless and the submarine fog-signals, which it will be observed have similar characteristics and periods, operate simultaneously. By observing the interval of time which elapses between the reception of these signals, either at the beginning or the end, the distance of the ship from the light-vessel may be calculated approximately. This should be done by allowing 1,625 yards (1,486 m.) for each second that the submarine fog-signal is heard after the W/T fog-signal</p>	

Country.	Call.	Wave-length.	Normal range.	Signals.	Period.
(1)	(2)	(3)	(4)	(5)	(6)
NORWAY (South Coast)					
Lille Faerder Lighthouse (Christiania Fjord Entrance) Lat. 59° or 36" N. Long. 10° 31' 54" E.	TRW	1,000	30 mi.	TRW, TRW, TRW repeated for VVV repeated for TRW, TRW, TRW, etc. Silence TRW, TRW, TRW, etc. VVV repeated for TRW, TRW, TRW, etc. Silence	15 sec. 35 sec. 15 sec. 5 sec. 15 sec. 35 sec. 15 sec. 60 sec.
NOTE.—Vessels wishing to have these fog signals operated at times other than during bad visibility should transmit a request to that effect <i>via</i> Tjömö W/T station (call signal LET). On receipt of the message, the fog signal will commence operating, and continue for half-an-hour.					
NORWAY (West Coast)					
Marsten Lighthouse Lat. 60° 07' 50" N. Long. 05° 01' 08" E.	TSY	1,000	30 mi.	TSY, TSY, TSY repeated for VVV repeated for TSY, TSY, TSY, etc. Silence TSY, TSY, TSY, etc. VVV repeated for TSY, TSY, TSY, etc. Silence	15 sec. 30 sec. 15 sec. 2 sec. 15 sec. 30 sec. 15 sec. 60 sec.
The above signals are transmitted automatically and are operated continuously during bad visibility and when the sound fog signals are in use					
NOTE.—Vessels wishing to have these fog signals operated at times other than during bad visibility should transmit a request to that effect <i>via</i> Bergen W/T station (call signal LGN). On receipt of the message, the fog signal will commence operating, and continue for half-an-hour.					
SPAIN					
Cabo Villano Lat. 43° 13' 56" N. Long. 09° 00' 43" W.	—	1,000	—	Dash of duration Silence Dash of duration Silence Etc., etc.	1 sec. 7 sec. 1 sec. 7 sec.
(Note frequency = 600)					
Cabo Finisterra Lat. 42° 52' 56" N. Long. 09° 16' 20" W.	—	1,000	—	Dash of duration Silence Dash of duration Silence Etc., etc.	$\frac{1}{2}$ sec. 7 sec. $\frac{1}{2}$ sec. 7 sec.
(Note frequency = 500).					
Cabo Prior Lat. 43° 34' 04" N. Long. 08° 18' 53" W.	—	1,000	—	The letter P (● — — — ●) with $\frac{1}{2}$ sec. intervals between letters for a period of Silence ● — — — ● Silence Etc., etc.	30 sec. 270 sec. 30 sec. 270 sec.
(Note frequency = 1400)					
Cabo Silleiro Lat. 42° 06' 40" N. Long. 08° 53' 58" W.	—	1,000	—	The letters RO (● — — — ● — — — — —) with $\frac{1}{2}$ sec. intervals between groups for a period of Silence RO Silence Etc., etc.	30 sec. 270 sec. 30 sec. 270 sec.
(Note frequency = 800)					
Isla de Salvora Lat. 42° 27' 51" N. Long. 09° 00' 49" W.	—	1,000	—	The signal formed by the letter S followed by six dashes (● ● ● — — — — —) with $\frac{1}{2}$ sec. intervals between groups for a period of Silence ● ● ● — — — — — Silence Etc., etc.	30 sec. 270 sec. 30 sec. 270 sec.
(Note frequency = 1,100)					
NOTE.—The above Beacons operate while fog covers the crests of the neighbouring mountains and is continued in operation until the horizon is clear,					

RADIO DIRECTION-FINDING DEVICES ON BOARD SHIP AND ON SHORE.

There are several types of radio compasses; in general, all in common use afloat find the direction of an incoming radio wave by revolving, centreing, or orientating a loop or coil with respect to the direction of the wave. A pointer and a graduated dial are usually used to determine the direction from which the wave comes, though in some cases the pointer is mounted directly above the navigational compass and bearings are read from the compass instead of from the graduated dial.

When the former method is used, the radio direction finder on board ship functions in a manner similar to the alidade, that is, the bearings obtained are "relative bearings": "true bearings" are obtained by applying to the ship's true heading the angle determined by the "relative bearing" after applying corrections thereto as noted below. When the direction finder is mounted directly over the navigational compass, the "compass bearing" of the incoming radio wave is read off direct, though this also must be corrected for radio deviation, as described below.

It is important to note that the bearing of an incoming radio wave is subject to quadrantal deviation not unlike magnetic compass; therefore, whether "relative" or "compass" bearings are observed, it is necessary to apply to the observed bearing of the radio wave a certain correction, which is determined by calibration of the radio compass, in order to obtain its actual direction. This deviation, unlike a magnetic compass, depends upon the *relative* bearing of the radio wave from the ship's head, rather than upon the heading of the ship itself. This quadrantal error is due principally to the ship's structure, and though subject to some change may be generally considered constant over a period of several months. In addition, the observed bearing may be affected by variable errors such as changes in position of wiring, metallic guys, antenna leads, etc. Especially will the open or closed condition of the other radio circuits on board affect the direction of the observed wave. The U.S. Navy requires all antenna circuits whether transmitting or receiving, to be open when observing direction by radio compass. Those using radio direction finding on board ship are cautioned to bear the above possible errors in mind and to keep radio compass calibrated at all times.

Shore radiocompass stations are calibrated for errors every six months and are checked daily by taking bearings of other shore stations, and care is taken to keep their electrical properties as constant as possible. The bearings of ships from shore radio compass stations have been corrected for all the known errors and give the ship's "true" bearing from the compass station.

CAUTION.—All radio compasses, whether installed on board ship or ashore, are subject to the "night effect," an indeterminate error which is sometimes experienced near nightfall and sunrise.

S.A.

General.

Masters of vessels desiring a station to transmit radio fog signals for a reasonable time, for the purpose of checking bearings or calibrating the radio compass, should make their request while the radio operator stands watch, using a radio-meter wave for calling.

When plotting radio bearings taken at a considerable distance on a Mercator projection chart, a correction must be made as the line of bearing is not straight excepting in the meridian.

Masters of vessels having radio compasses are requested to test these signals and to advise the Department of Commerce, through the Commissioner of Lighthouses, Washington, D.C., of the results obtained.

Country.	Call.	Wave-length.	Normal range.	Signals.	Period.
(1)	(2)	(3)	(4)	(5)	(6)
Boston Lightship (Mass.) Lat. 42° 20' 22" N. Long. 70° 45' 26" W.	—	1,000	50 mi.	<p>— • — • — • , etc.</p> <p>Silent</p> <p>This station does not maintain radio communication service.</p> <p>The operator keeps watch for the first 15 minutes of each hour from 1300 to 0115, G.M.T. for the purpose of answering requests from vessels to transmit fog signals.</p> <p>(a) W/T.</p> <p>— — — — —</p> <p>(groups of four dashes) for</p> <p>Silent</p> <p>(b) Submarine Oscillator</p> <p>The submarine oscillator sounds two groups of six blasts of 1 second's duration each, every 90 sec., the silent interval between successive blasts in a group being 3.5 sec., thus:—</p> <p>6 blasts for</p> <p>Silent</p> <p>6 blasts</p> <p>Silent</p> <p>In each repetition of the characteristics of the signals the first dash of the W/T fog-signal and the first blast of the submarine oscillator are sounded simultaneously.</p> <p>Radio fog signals will be sounded continuously in clear weather for the second 15 minutes of each hour. Radio operator stands watch on 600 metres (500 k.c.) for the first 15 minutes of each hour from 8 a.m. to 10.15 p.m. daily in clear weather and from 10 to 10.15 a.m., and 4 to 4.15 p.m. daily in foggy weather. (75th Meridian Time).</p>	<p>55 sec.</p> <p>20 sec.</p> <p>—</p> <p>60 sec.</p> <p>30 sec.</p> <p>23.5 sec.</p> <p>12 sec.</p> <p>23.5 sec.</p> <p>31 sec.</p>
Nantucket Shoals Lightship (Mass.) Lat. 40° 37' 02" N. Long. 69° 37' 06" W.	WWAH	1,000	50 mi.		

Country.	Call.	Wave-length.	Normal range.	Signals.	Period.
(1)	(2)	(3)	(4)	(5)	(6)
Fire Island Lightship (N.Y.) Lat. 40° 28' 40" N. Long. 73° 11' 26" W.	WWAN	1,000	50 mi.	<p>— — — — — (groups of 2 dashes) for 50 sec</p> <p>Silent 15 sec</p> <p>Radio fog signal will also be sounded daily in clear weather from 9 to 9.30 a.m. and from 3 to 3.30 p.m. (75th meridian time).</p>	
Ambrose Channel Lightship (N.Y.) Lat. 40° 27' 59" N. Long. 73° 50' 02" W.	WWAO	1,000	50 mi.	<p>— — — — — (single dash) repeated for 65 sec</p> <p>Silent 25 sec</p> <p>Radio fog signal will also be sounded daily in clear weather from 9 to 9.30 a.m. and from 3 to 3.30 p.m. (75th meridian time.)</p>	
Five-Fathom Bank Lightship (New Jersey) Lat. 38° 47' 16" N. Long. 74° 34' 33" W.	WWAR	1,000	50 mi.	<p>— — • • • — — • • • — — • • • etc. 40 sec</p> <p>Silent 25 sec</p>	
Sea Girt Lightship (N.J.) Lat. 40° 08' 12" N. Long. 74° 01' 40" W.	—	1,000	50 mi.	<p>— — — — — (groups of 3 dashes) for 30 sec</p> <p>Silent 3 min</p> <p>NOTE.—This station does not maintain radio communication service.</p> <p>Radio fog signal will also be sounded daily in clear weather from 9 to 9.30 a.m. and from 3 to 3.30 p.m. (75th meridian time).</p>	
Cape Henry Lightship (Va.) Lat. 36° 55' 35" N. Long. 76° 00' 27" W.	—	1,000	50 mi.	<p>• • — — — • • — — — • • — — — etc. 20 sec</p> <p>Silent 15 sec</p> <p>NOTE.—This station does not maintain radio communication service.</p>	
Diamond Shoal Lightship Lat. 35° 05' 18" N. Long. 75° 19' 44" W.	WWAZ	1,000	50 mi.	<p>— — — — — (groups of 2 dashes) repeated 30 sec</p> <p>Silent 30 sec</p> <p>Radio fog signal will also be sounded daily in clear weather from 9 to 9.30 a.m. and from 3 to 3.30 p.m. (75th meridian time.)</p>	
San Francisco Lightship (Calif) Lat. 37° 45' 03" N. Long. 122° 41' 30" W.	WWBV	1,000	50 mi.	<p>— — — — — etc. 60 sec</p> <p>(groups of 2 dashes) repeated 60 sec</p> <p>Silent</p>	
Blunts Reef Lightship (Calif) Lat. 40° 26' 04" N. Long. 124° 30' 14" W.	WWBU	1,000	50 mi.	<p>— — — — — (single dashes), etc... 60 sec</p> <p>Silent 2 min</p> <p>Radio fog signal will also be sounded daily in clear weather for first 15 minutes of every even hour from 10 p.m. to 6.15 a.m.</p>	
Columbia River Lightship (Oregon) Lat. 46° 10' 45" N. Long. 124° 10' 35" W.	WWBQ	1,000	50 mi.	<p>— — — — — (groups of 3 dashes) repeated 60 sec</p> <p>Silent 30 sec</p> <p>Radio fog signal is operated for the first 15 minutes of every even hour from 10 p.m. to 6.15 a.m. The signal is also operated in clear weather from 9 to 9.30 a.m. and from 3 to 3.30 p.m.</p>	
Swiftsure Bank Lightship (Wash) Lat. 48° 31' 44" N. Long. 125° 00' 00" W.	WWBO	1,000	50 mi.	<p>— — — — — (groups of 2 dashes) repeated 60 sec</p> <p>Silent 30 sec</p> <p>Radio fog signal is operated for the first 15 minutes of every odd hour from 0300 to 1115 G.M.T. The signal is also operated in clear weather from 1400 to 1430, and 2000 to 2030 G.M.T.</p> <p>In addition to the above named stations, radio fog signals will be established in 1925 at the following places:—Grays Harbour, Washington; Cape Blanco, Oregon; Point Sur, Point Arguello and Los Angeles Harbour, California; Devils Island, Manitou Island and Whitefish Point, Lake Superior; Detour Point and Lake Huron Lightship, Lake Huron; Buffalo, Lake Erie; South Pass Jetty, Louisiana; and Galveston Jetty, Texas.</p>	

DEFINITIONS OF TECHNICAL TERMS.

ABSORPTION CO-EFFICIENT.—(See Attenuation, Co-efficient of).

ACCUMULATORS.—Electric cells consisting of coated lead plates in dilute acid, capable of storing as chemical energy, energy supplied as electric current, and, when connected to an electric circuit, giving up as current a certain proportion of that originally supplied.

AERIAL.—The conductor, or system of conductors, designed to radiate or receive energy from the æther in the form of electro-magnetic waves.

AERIAL, BALANCING.—(See Balancing Aerial).

AERIAL-DIRECTIONAL.—An aerial system designed to radiate or absorb energy better in some direction than in others.

ÆTHER.—The imponderable, elastic, all-pervading medium which is assumed to exist in order to explain the transmission of energy in the form of electro-magnetic waves.

ALTERNATING CURRENT.—A current whose magnitude and direction are subject to a periodic change.

ALTERNATOR.—A generator of alternating current, which is a current periodically changing in direction of flow.

AMMETER.—A low-resistance direct-reading instrument for the measurement of current.

AMPERE.—The practical unit of electric current. It is 10^{-1} C.G.S. units.

AMPLIFICATION, CO-EFFICIENT OF.—The ratio of the useful effect produced by the employment of an amplifier, to that obtained without it. In a triode it may be defined as the ratio of the slopes of the grid voltage and anode voltage against anode current curves at the operating point.

AMPLIFIER.—An instrument for increasing the effect of weak received signals, by causing them to control a local source of energy varying in accordance with that received. (See also triode.)

AMPLITUDE.—The maximum value of current or voltage attained during a half-period of alternating current or voltage.

ANODE.—The positive electrode.

ANTENNA.—Another name for Aerial q.v.

ANTINODE.—In a linear oscillating circuit it is the point of maximum amplitude of the quantity under consideration. The Antinode of current is the node of potential.

APERIODIC CIRCUIT.—One which has no definite time period and in which a current, if started, dies down without reversing.

ARC.—A luminous discharge through a gas in which the material of one or both of the electrodes is volatilised and takes part in the conduction of the current, whether continuous or alternating.

ARRESTER, EARTH.—A spark gap with very short gap and large sparking surfaces. It is used to protect the receiving apparatus, which is joined across it, from powerful discharges.

ARMATURE of a dynamo is the winding in which the e.m.f. is produced.

ASYNCHRONOUS.—Two periodic forces are said to be asynchronous when their time periods are different from each other.

ATMOSPHERIC ABSORPTION.—That portion of the total loss of radiated energy due to atmospheric conductivity.

ATMOSPHERICS.—Electromagnetic waves produced by disturbances in the atmosphere or in the earth's surface.

ATTENUATION.—Is the loss of strength of waves due to atmospheric absorption.

ATTENUATION, CO-EFFICIENT OF.—The co-efficient which, when multiplied by the distance of transmission, gives the natural logarithm of the ratio of the amplitude of the electric or magnetic force at that distance to the initial value of the corresponding quantity.

AUDIO-FREQUENCY.—The range of frequencies perceptible by the ear, *i.e.*, between 40 and 20,000 per second.

AUDION.—De Forest's three-electrode valve.

AUTODYNE.—Another name for self-heterodyne.

AUTO-TRANSFORMER.—A transformer in which the primary and secondary windings are tapped off the same coil and have a number of turns in common.

BALANCING AERIAL.—An aerial used in duplex wireless telegraphy to eliminate the effect of the local transmitter.

BARRETTTER.—A receiving instrument in which the electric conductivity is altered, by the heat generated by the reception of waves.

BEAM TRANSMISSION.—Transmission in which the radiation is concentrated into a beam in a given direction, usually by means of reflectors arranged in the form of a parabola in the focus of which the radiator is placed.

BEAT.—When two oscillations of slightly different frequencies are impressed on an electrical circuit, they periodically help and oppose each other. The result is an oscillation, the amplitude of which varies in a regular and periodic manner. The time between two successive maxima of amplitude is called the period of the beat. The beat frequency or number of periods per second is equal to the difference of the frequencies of the component oscillations.

BREAK.—An apparatus for producing sudden interruption of an electric circuit.

BRUSH DISCHARGE.—A faintly luminous electric discharge from the surface of a conductor at a high potential due to the ionisation of the surrounding air.

BUZZER.—A make and break producing weak oscillations which are very convenient for testing purposes.

CALIBRATION.—Of the scale of an instrument is the determination of value of a certain number of fixed points.

CAPACITY.—That property of a material by virtue of which it is capable of storing energy electrostatically. The capacity of a system is dependent on its geometrical dimensions, its position relative to other conductors and the dielectric constants of the surrounding media.

CARRIER WAVE.—The high-frequency electro-magnetic waves, variations in the amplitude of which, caused by the microphone, convey speech in wireless telephony.

CATHODE.—The negative electrode.

CATHODE RAYS.—A stream of electrons emitted by an incandescent cathode in a vacuum, the movement of which can be controlled by an electric field.

C.G.S.—A system of units based on the centimetre, gramme and second.

CHARACTERISTIC CURVE.—Is a curve drawn to show the relations between two quantities in which the variation of one causes a corresponding variation of the other.

CHOKE.—A coil with large inductance and small resistance designed to prevent the passage of alternating current, but to permit the passage of continuous current.

CIRCUITS, OPEN AND CLOSED.—A closed oscillating circuit is one in which the capacity and inductance are substantially localised in different places, while an open radiating or absorbing circuit, though it may have additional localised capacity and inductance, contains the aerial with the capacity and inductance distributed throughout its length.

CIRCUIT-BREAKER.—A mechanism which automatically opens a circuit when a certain predetermined current is exceeded.

COHERER.—An early form of detector consisting of a contact or collection of contacts which cohere or become relatively conductive under the stimulus of an oscillating potential.

COMMUTATOR.—An arrangement of fixed or movable contacts which determine the path or direction of an electric current. In a dynamo it is the part from which the current is collected.

COMPASS, RADIO.—Another name for "Direction Finder."

CONDENSER.—A pair of conductors or systems of conductors separated by a thin dielectric suitable for the temporary storage of electric energy.

CONDENSER, VARIABLE.—A condenser, the capacity of which may be varied by the movement of one set of plates or conductors relatively to the other.

COUNTERPOISE.—A system of electrical conductors forming one portion of a radiating oscillator, the other portion of which is the aerial. In land stations a counterpoise forms a capacity connection to earth.

COUPLING.—The connection between two circuits by which energy is transferred from one to the other. The connection may be by magnetic, electrostatic or direct coupling, or by any combination of these.

COUPLING, CO-EFFICIENT OF.—In inductively coupled circuits the ratio of the mutual inductance to the square root of the product of the separate self-inductances. The co-efficient of coupling (k) between any two circuits tuned to the same frequency and then coupled is given by the formula:—

$$k = \frac{\lambda_1^2 - \lambda_2^2}{\lambda_1^2 + \lambda_2^2}$$

where λ_1, λ_2 are the longer and shorter resulting natural wavelengths of the coupled system.

CRYSTAL.—A detector which uses the rectifying properties of the contact between a crystal and a metal surface, or between two crystals.

CYMOMETER.—A "wave-measurer."

DAMPING.—The diminution of energy due to the losses which always occur when the energy is alternating between the static and kinetic forms.

DECREMENT.—The natural logarithm of the constant ratio of the amplitudes of a damped oscillation in successive half periods.

DECREMENTER.—An instrument for measuring decrement.

DETECTOR.—That part of the receiving apparatus which converts the high frequency current into a form which can be perceived visually or by the ear.

DIELECTRIC.—A non-conducting medium through which electric force can act and which is capable of storing electric energy.

DIELECTRIC CONSTANT.—The ratio of the capacity of a condenser with the dielectric as medium to that of the same condenser with air or vacuum as medium.

DIFFRACTION.—The bending of electromagnetic waves into the region of the geometrical shadow of an opaque object over which the ray passes. The amount of diffraction depends on the wavelength, increasing with increase of wavelength.

DIPLEX.—The simultaneous transmission and reception of two messages in the same direction between two stations.

DIRECTION FINDER.—A receiving instrument which, in combination with a special aerial system, enables the direction of the transmitting station to be determined.

DISCHARGER.—The piece of transmitting apparatus across the electrodes of which the spark discharge takes place.

DISPLACEMENT CURRENT.—The transient current through a dielectric.

DUPLEX.—The simultaneous transmission and reception of two messages in opposite directions between two stations.

DYNAMO.—A machine for generating continuous E.M.F. by making conductors cut lines of magnetic force. It changes mechanical energy into electrical energy.

EARTH.—The connection to the earth which in most systems forms the lower extremity of the aerial system.

EARTH SCREEN.—A system of conductors underneath a transmitting aerial, to which it is connected, offering a low resistance path for the oscillations of the oscillating system.

ELECTRODE.—The end of a metallic conductor in an electric circuit where the current passes to another medium such as liquid or gas.

ELECTROLYSIS.—The splitting up of the molecules of a liquid into positive and negative ions by the passage of an electric current.

ELECTROMAGNETIC AND ELECTROSTATIC UNITS.—Are systems of units based on unit magnetic pole and unit electric charge respectively. The ratio of the units of one system to that of the other is $V = 3 \times 10^{10}$.

ELECTRON.—The natural unit of negative electricity (4.774×10^{-10} electrostatic units).

ENDODYNE.—Another name for "self-heterodyne."

ETHER.—See *Æther*.

FILAMENT.—That part of a valve which is rendered incandescent by the current, and is the source of negative ions or electrons which convey the high frequency currents.

FARAD.—The practical unit of capacity; it is 10^{-9} C.G.S. units. In wireless work the microfarad is generally used. It is one-millionth of a farad.

FORM FACTOR.—The form factor of a symmetrical aerial for a given wavelength is the height of the centre of capacity (*i.e.*, the effective height) divided by the actual height.

FREQUENCY.—A term used in connection with any form of rhythmical motion or rhythmical change, denoting the number of complete movements or changes in a given time—usually a second.

FREQUENCY, AUDIO.—See Audio-frequency.

FREQUENCY, BEAT.—See Beat.

FREQUENCY, GROUP.—The frequency of definite variations in amplitude of an alternating current. The spark frequency.

FREQUENCY, RADIO.—A frequency higher than the normally audible vibrations, that is, higher than 10,000 cycles per second.

FUNDAMENTAL.—The wave of lowest frequency to which a circuit can be tuned for any particular adjustment.

GALVANOMETER.—An instrument for indicating or measuring an electric current.

GRID.—The controlling electrode of a triode. It is generally in the form of a grid or mesh placed between the cathode and anode.

GRID LEAK.—(See Leak, Grid).

GROUND.—The American equivalent of "Earth."

HARD.—Applied to thermionic tubes containing an inappreciable amount of gas.

HARMONIC.—A wave whose frequency is a simple multiple of that of the fundamental.

HENRY.—The practical unit of inductance. It is 10^{-9} C.G.S. units. In high-frequency work the microhenry is used. It is one-millionth of a Henry.

HETERODYNE.—The production of beats by reaction between locally generated oscillations and the received oscillations.

HETERODYNE, SELF.—A receiver in which a triode acts simultaneously as a detector and as a generator of beat-producing oscillations.

HYSTERESIS.—The property of a body which causes the effect of changing conditions to lag behind, and not bear a constant ratio to, these conditions thus causing a loss.

IMPEDANCE.—The opposition to the flow of an alternating current. It is numerically equal to the square root of the sum of the squares of the resistance and the reactance of the circuit.

INDUCTANCE.—The opposition of a circuit (due to the magnetic field linked therewith) to any variation of the current flowing therein.

INDUCTION.—The property one circuit carrying a varying current has of causing or inducing currents in another conductor at a distance.

INSULATOR.—A non-conductor of electricity used to insulate a conductor or prevent the escape of electricity from a predetermined path.

INTERFERENCE.—The reinforcement or neutralisation of waves arriving at a point along different paths from the same source.

IONISATION.—The formation of ions or charged particles or electrons which facilitate the passage of electricity through a liquid or gas.

JAMMING.—The prevention of the reception of signals from one station to another, by a third station sending stronger signals, which interfere with the message.

JAR.—A capacity of a thousand centimetres.

JIGGER.—The air core transformer used to couple wireless circuits.

KALLIROTRON.—A form of aperiodic retroactive amplifier, consisting of two thermionic valves so connected by pure resistances that a rise of grid potential of either produces a fall of grid potential of the other.

KATHODE.—See Cathode.

KENETRON.—A type of vacuum tube rectifier, in which the current is carried entirely by electrons, otherwise a very hard valve.

KEY.—An instrument for completing or interrupting a circuit. A manipulating key is that used to send out the dots and dashes of the Morse code.

LEYDEN JAR.—A modification of the original form of the condenser.

LEAK GRID.—A high resistance connected across a condenser in series with the grid to limit the potential obtained.

LINE OF FORCE.—In a magnetic or electric field an imaginary line drawn to indicate the direction of the force. The closeness of the lines is a measure of the intensity of the field.

LOADING COIL.—An inductance coil placed in a circuit to increase its wavelength.

LOGARITHMIC DECREMENT.—(See Decrement).

LOOP.—Another name for antinode.

LOW FREQUENCY.—Having alternations which recur less than 20,000 times per second.

MAGNETIC DETECTOR.—A detector depending on the effect of oscillations on the hysteresis of soft iron.

MAGNIFIER NOTE.—A valve in conjunction with an iron core transformer, for increasing the amplitude of the audio-frequency current.

MICROPHONE.—An instrument capable of responding to mechanical vibrations, such as sound, and transforming them into variations of an electric current.

MORSE CODE.—The usually recognised system of representing letters or words or phrases by a combination of dots and dashes.

NATURAL WAVELENGTH OR FREQUENCY.—Is the wavelength or frequency of the fundamental vibration of the circuit.

NODE.—A point of zero amplitude on a stationary wave.

OHM.—The practical unit of electrical resistance. It is 10^9 C.G.S. units. High resistances such as that of insulators are expressed in megohms. A megohm is one-million ohms.

OSCILLATIONS.—High frequency alternations in tuned circuits.

OSCILLATOR.—A circuit possessing capacity and inductance, designed to be easily set into electrical vibration. Also a circuit producing continuous waves by means of a triode valve.

OSCILLOGRAPH.—An apparatus for observing or recording, quickly varying currents or potential differences.

PERIOD.—Any varying quantity which repeats its values regularly at equal time intervals is said to be periodic, and the time-interval of one repetition is called the periodic time or period.

PERMEABILITY.—The ratio of the magnetic flux density produced in any medium by a given magnetomotive force to that produced in a vacuum (or, for practical purposes, in air).

PHASE.—The stage or state to which a periodic variation has proceeded.

PITCH.—The name used in music to express the frequency of a note.

PLATE.—The anode of a thermionic tube.

PLIODYNATRON.—A combination of pliotron and a dynatron, being a four-electrode thermionic tube. The output is controlled by the control grid which is between the filament and the heavier grid-anode.

PLIOTRON.—A very hard triode.

POLARISATION.—A voltaic cell is polarised when the passage of the working current has caused such changes at the electrodes as tend to stop the current.

POLARISED RADIATION.—A wave is said to be plane polarised when its electric and magnetic displacements are confined to two planes at right angles. When the plane of the electric and magnetic displacement rotates uniformly with time the waves are said to be circularly polarised.

POTENTIAL.—The power of doing work. It corresponds with the pressure of a water supply. It is measured in volts.

POTENTIOMETER.—An instrument for adjusting at will the potential between two points.

POWER FACTOR.—Of an A.C. circuit is the ratio of the true to the apparent watts. If the volts and amperes are sinodal the power factor is the cosine of the angle of the phase difference.

QUENCHING.—Devices for cooling the spark gap in the primary of two closely coupled circuits, causing the spark to be extinguishing as soon as the energy has passed over to the secondary circuit, and thus preventing its return.

RADIO.—American equivalent of "wireless." (See also Frequency Radio.)

RADIOGONIOMETER.—Another name for Direction Finder.

RADIOGRAM.—A telegram sent by wireless.

RADIOTELEPHONE.—An apparatus for the transmission of speech by wireless.

REACTANCE.—A function of the resistance, inductance, capacity and impressed frequency of a circuit. Also the American equivalent of "choke."

REACTION COIL.—A coil in the plate circuit coupled to the grid circuit which reinforces the received oscillations.

RECEIVER.—The instrument for receiving and rendering perceptible, wireless signals including tuning and detecting circuits.

RECTIFIER.—An apparatus for converting alternating into continuous current, or into pulses of unidirectional current.

REFRACTION.—The change in the direction of propagation of a wave, caused by a change in the medium.

RELAY.—An apparatus by means of which a current, too small to perform the required work, is made to control a larger and adequate current.

RESISTANCE.—That property of a conductor which transforms electrical energy into heat.

RESISTANCE, AERIAL.—That resistance which (other things being equal) would dissipate the same energy as the aerial radiates.

RESISTANCE, CRITICAL.—The limiting resistance beyond which the oscillatory discharge of a circuit passes into an aperiodic discharge.

RESONANCE.—The cumulative effect produced by a periodic force in a circuit of such frequency that the maximum effect is obtained

RHEOSTAT.—A circuit the resistance of which can be varied so as to control the current passing.

ROOT MEAN SQUARE VALUE.—Is the square root of the sum of the squares of the successive values of the current throughout a half period. It is a measure of the heating value of the current.

ROTARY DISCHARGER.—A discharger in which one or both of the electrodes revolve.

SELECTIVITY.—The power of a receiving system to discriminate between a number of simultaneous signals.

SELF-INDUCTION.—Another name for "inductance."

SHORT CIRCUIT.—Contacts cutting out part of an electrical circuit, by offering a shorter path for the current.

SIMPLE HARMONIC MOTION.—The motion of the projection of a body moving with constant angular velocity on one of the diameters.

SKIN EFFECT.—Is the name given to the uneven distribution of a high frequency current across the cross-section of a conductor, being greatest at the surface and least at the centre.

SOFT.—Applied to thermionic tubes containing an appreciable amount of gas.

SOLENOID.—A length of wire wound into a coil or helix.

SPARK.—A luminous electrical discharger across a gap.

SPARK, QUENCHED.—(See Quenching).

SPECIFIC INDUCTIVE CAPACITY.—Another name for "dielectric constant."

STATIC.—The American equivalent of "Atmospherics."

STRAYS.—Another name for "Atmospherics."

STARTER.—An arrangement of resistances and switch contacts, for controlling the current in the field and armature windings, in an electric motor starting from rest.

SYNCHRONOUS.—Means equality of period. Two periodic changes proceeding simultaneously.

SYNTONY.—The adjustment of one circuit to another, or of one transmitter taken as a whole to another receiver taken as a whole, in such a way that their time periods are the same, and waves of a different time period produce little or no effect on the system.

TELEPHONE.—Is the instrument employed in wireless telegraphy to convert current variation into sound.

THERMIONS.—Electrons liberated from an incandescent cathode.

THERMIONIC RECTIFIER.—A Fleming valve or vacuum tube with two electrodes, the filament (incandescent) and the grid.

TICKER OR TIKKER.—A rapid make-and-break device used in conjunction with a resonant circuit and a pair of telephones, as a receiver for continuous waves.

TONE WHEEL.—A high speed commutator used as a receiver for continuous waves. It is run at a speed slightly different from the synchronous speed for the wave frequency, and in effect converts the high frequency current into a current of audible frequency.

TONIC TRAIN.—Transmission of continuous waves interrupted regularly by such an instrument as a ticker or tone wheel.

TRAIN OF WAVES.—The waves produced by one discharge of the primary condenser in a spark circuit.

TRANSFORMER.—An apparatus for transferring energy from one circuit to another by magnetic induction. It may or may not alter the potential.

TRIODE.—A three-electrode thermionic tube.

TUBE, VACUUM.—The American expression for valve.

TUNING.—Adjustment of a circuit to synchronism or resonance. Tuning is called sharp when a small difference of frequency produces a large change in the current. The sharpness of tuning depends on the amount of damping in the received waves or in the receiver.

UNDAMPED WAVES.—Having no decrement or damping.

VALVE, TWO-ELECTRODE.—A vacuum tube with a filament and one electrode used as a detector and rectifier for alternating currents.

VALVE, THREE-ELECTRODE.—A vacuum tube with a filament and two electrodes, the grid and plate, used for amplifying and detecting oscillating currents.

VARIOMETER.—A circuit the inductance of which can be continuously varied between certain limits.

VOLT.—The practical unit for the measurement of potential. It is 10^8 C.G.S. units.

VOLTMETER.—A direct reading instrument for the measurement of potential difference.

WAVE, ELECTRO-MAGNETIC.—A periodic alteration of the electrical condition of the ether.

WAVELENGTH.—The distance (measured in the line of propagation of the wave) between two consecutive maxima of the same sign.

WAVEMETER.—A calibrated circuit of variable frequency with a detector to indicate the position of resonance.

WING CIRCUIT.—Another name for the anode circuit of a triode.

X's.—Another name for "Atmospherics."

The terms included in this list are grouped under the fundamental word, *e.g.* receiving apparatus will be found under "apparatus."

ENGLISH.	FRENCH.	ITALIAN.	SPANISH.	GERMAN.
Absorption, atmospheric	Absorption atmosphérique	Assorbimento atmosferico	Absorción atmosférica	Atmosphärische Absorption
Aerial, aperiodic	Antenne aperiodique	Aereo (antenna)	Antena	Luftdraht (Antenne)
Aerial, balancing	Antenne de compensation	Aereo aperiodico	Antena aperiódica	Aperiodischer Luftdraht
Aerial, counterpoise.	Contrepoids électrique	Antenna di compensazione	Antena compensadora	Ausgleichsluftdraht
Aerial, directional	Antenne dirigée	Contrappeso	Contrapeso (or Contraantena)	Gegengewicht
Aerial, frame	Cadre de réception	Aereo dirigibile	Antena dirigida	Gerichteter Luftdraht
Aerial, horizontal	Antenne horizontale	Quadro di ricezione	Cuadro de recepción	Rahmenantenne
Aerial, L-shaped	Antenne en L	Aereo orizzontale	Antena horizontal	Horizontaler Luftdraht
Aerial, multiple	Antenne multiple	Antenna a L	Antena en L	L-förmige Antenne
Aerial, orientation of	Orientation de l'antenne	Aereo multiplo	Antena múltiple	Mehrfache Antenne
Aerial, receiving	Antenne de réception	Orientazione dell'aereo	Orientación de la antena	Orientation der Antenne
Aerial, spaced	Antenne espacée	Aereo di ricezione	Antena de recepción	Empfangsluftdraht
Aerial, T-shaped	Antenne en T	Aereo spaziato.	Antena espaciada	—
Aerial, trailing (for aeroplane)	Antenne pendante	Antenna a T	Antena en T	T-förmige Antenne
Aerial, transmitting.	Antenne d'émission	Coda d'aereo	Antena colgante	Freihängende Antenne
Aerial, umbrella	Antenne en parapluie	Aereo di trasmissione	Antena de transmisión	Sendeluftdraht
Aeroplane	Avion	Aereo a forma di ombrello	Antena en forma de paraguas	Schirmluftdraht
Alternator	Alternateur	Aeroplano	Avion (or) Aeroplano	Flugzeug
Alternator, high frequency	Alternateur à haute fréquence	Alternatore	Alternador	Wechselstrommaschine
Ammeter.	Ampèremètre	Alternatore ad alta frequenza	Alternador de alta frecuencia	Hochfrequenzalternator
Ammeter, hot-wire	Ampère-mètre thermique	Amperometro	Amperímetro	Ampèremeter (Strommesser)
Ammeter, moving coil	Ampère-mètre à cadre mobile	Amperometro a filo caldo	Amperímetro térmico	Hitzdrahtstrommesser
Anchor (mast)	Ancre	Amperometro a bobina mobile	Amperímetro d'Arsonval	Drehspulenstrommesser
Amplifier	Amplificateur	Ancoraggio	Andaje	Verankerung
Amplifier, transformer coupled	Amplificateur à couplage par transformateurs	Amplificatore con accoppiamento a trasformatori	Amplificador con acoplo de transformadores	Verstärker
Amplifier, resistance coupled	Amplificateur à couplage par résistances	Amplificatore con accoppiamento a resistenze	Amplificador con acoplo de resistencias	Ein durch Transformator gekoppelter Verstärker
Amplifier, capacity coupled	Amplificateur à couplage par capacités	Amplificatore con accoppiamento a capacità	Amplificador con acoplo de capacidades	Ein durch Widerstände gekoppelter Verstärker
Amplitude	Amplitude	Amplificatore con accoppiamento a capacità	Amplificador con acoplo de capacidades	Ein durch Kapazität gekoppelter Verstärker
Anode	Anode	Amplezza	Amplitud	Amplitude
Apparatus	Appareil	Anodo	Anodo	Anode
Apparatus, receiving	Appareils de réception	Apparecchio	Aparato	Apparat
Apparatus, transmitting.	Appareils de transmission	Apparecchi di ricezione	Aparatos receptores.	Empfänger
Arc	Arc	Apparecchi di trasmissione	Aparatos transmisores	Sender
Arrester, lightning	Parafoudre	Arc	Arco	Lichtbogen
Atmospherics	Perturbations atmosphériques	Dispositivo scaricafulmine	Pararrayos	Blitzschutz
Autodyne (self-heterodyne)	Autodyne	Perturbazioni atmosferiche	Perturbaciones atmosféricas	Luftstörungen
Battery	Batterie	Autodina	Autodina	Autodyn
Battery, accumulator	Batterie d'accumulateurs	Batteria	Bateria	Batterie
Battery, auxiliary	Batterie auxiliaire	Batteria di accumulatori	Bateria de acumuladores	Akkumulatorenbatterie
Battery, dry cell	Batterie sèche	Batteria ausiliare	Bateria auxiliar	Verstärkungsbatterie
Battery, filament	Batterie de chauffage	Batteria a secco	Bateria seca	Trockenbatterie
Battery, high tension	Batterie à haute tension	Batteria d'accensione dei filamenti	Bateria del filamento	Heizbatterie
Battery, wireless	Batterie à haute tension Radiophare	Batteria ad alta tensione Radiofaro	Bateria de alta tensión Radiofaro	Hochspannungsbatterie Drahtlos-Leuchtt.

Bearing (machine)	Panier	Battimenti	Pulsaciones	Schwebungen
Beats (heterodyne)	Battimenti	Campanello	Timbre de llamada	Lockklingel
Bell, call	Sonnerie d'appel	Motor del ventilatore	Motor ventilador	Blasemotor (Ventilator)
Blower-motor	Ventilateur	Radiodiffusione	Radiodifusión	Rundfunk
Broadcasting	Radiophonie	Cassetta di raccordo	Caja de unión	Verbindungskasten
Box, junction	Boîte de jonction	Cassetta di protezione	Barre colectoras principales	Schutzkasten
Box, screening	Boîte de garde	Sbarre collettrici principali	Edificio de la estación	Hauptsammelschienen
Busbars (main)	Barres omnibus principales	Fabbricato della stazione	Zambador	Stationsgebäude
Building, station	Bâtiment du poste	Vibratore (cicala)	Cable con envuelta de plomo	Summer
Buzzer	Vibrateur (buzzer)	Cavo ad involucro di piombo	Cable con envuelta de caucho	Bleikabel
Cable, lead-covered	Câble sous plomb	Cavo ad involucro di gomma	Contraste (graduación)	Gummikabel
Cable, rubber-covered	Câble sous caoutchouc	Taratura	Capacidad	Eichung
Calibration	Etalonnage	Capacità	Capacidad de la antena	Kapazität
Capacity	Capacité	Capacità dell'aereo	Capacidad inductiva específica	Luftdrahtkapazität
Capacity, aerial	Capacité de l'antenne	Costante dielettrica	Catodo incandescente	Spezifische induktive Kapazität
Capacity, specific inductive	Capacité inductive spécifique	Catodo incandescente	Pila	Glühende Kathode (Glühkathode)
Capacity earth (see Earth screen)	Cathode incandescente	Element (pile)	Cambio de conexiones para la recepción	Element
Cathode, incandescent	Element (pile)	Commutazione per ricezione	Cambio de conexiones para la transmisión	Umschaltung auf Empfangen
Cell	Commutazione per ricezione	Commutazione per trasmissione	Carta	Umschaltung auf Senden
Change of connections	Commutazione per trasmissione	Carta	Bobina di reactancia protectora de núcleo de aire	Karte
Change of connections for receiving	Carta	Bobina di protezione a nucleo di aria	Reactancia con núcleo de hierro	Impedanzspule für hohe Frequenz mit Luftkern
Change of connections for transmitting	Bobina di protezione a nucleo di aria	Bobina d'impedenza a nucleo di ferro	Reactancia para telefonía	Drosselspule mit Eisenkern
Chart	Bobina d'impedenza a nucleo di ferro	Impedenza modulatrice	Bobina de reactancia	Modulationreaktanz
Choke, air core protecting	Bobina di reattanza	Bobina di reattanza	Circuito	Drosselspule
Choke, iron core	Circuito	Circuito oscillante chiuso	Circuito oscillante cerrado	Kreis
Choke, speech	Bobine de choc	Circuito del condensatore	Circuito de mando	Geschlossener Schwingungskreis
Choke coil	Circuit	Circuito di comando	Circuito de rejilla	Kondensatorkreis
Circuit	Circuit oscillant fermé	Circuito di griglia	Circuito intermedio	Steuerkreis
Circuit, closed oscillating	Circuit du condensateur	Circuito intermedio	Circuito radiador abierto	Gitterkreis
Circuit, condenser	Circuit d'impulsion	Circuito radiante aperto	Circuito oscillante	Zwischenkreis
Circuit, drive	Circuit d'impulsion	Circuito oscillante	Circuito de placa	Offener Strahlungskreis
Circuit, grid	Circuit de grille	Corto circuito	Interruptor con apertura y cierre automáticos	Schwingungskreis
Circuit, intermediate	Circuit intermédiaire	Interruttore	Bobina	Anodenkreis
Circuit, open radiating	Circuit ouvert rayonnant	Bobina	Bobina de anti-reacción	Kurzschluss
Circuit, oscillatory	Circuit oscillatoire	Bobina de anti-reazione	Bobina en forma de fondo de cesta	Stromunterbrecher und Stromschliesser
Circuit, plate	Circuit de plaque	Bobina a fondo di panier	Bobina de acoplamiento	Spule
Circuit, short	Court-circuit	Bobina d'accoppiamento	Bobina inductiva	Entgegengesetzte-Rückkopplungsspule
Circuit breaker and maker	Disjoncteur et conjointeur automatique	Rocchetto d'induzione	Bobina de inducción	Flachspule
Coil	Bobine	Bobina di reazione	Bobina de reacción	Kopplungsspule
Coil, anti-reaction	Bobine d'anti-reaction	Self fond de panier	Bobine d'accouplement	Drosselspule
Coil, basket	Self fond de panier	Bobine de réaction	Bobine d'induction	Induktionsspule
Coil, coupling	Bobine de réaction	Bobine de réaction	Bobine de réaction	Reaktionsspule
Coil, impedance	Bobine de réaction	Bobine de réaction	Bobine de réaction	
Coil, induction	Bobine d'induction	Bobine de réaction	Bobine de réaction	
Coil, reaction	Bobine de réaction	Bobine de réaction	Bobine de réaction	

TECHNICAL VOCABULARY—continued.

ENGLISH	FRENCH	ITALIAN	SPANISH	GERMAN
Coil, search	Bobine d'exploration	Bobina esploratrice	Bobina de exploración	Suchspule
Coil, tuning	Bobine d'accord	Bobina di sintonizzazione	Bobina de sintonización	Abstimmspule
Compass	Compas (Boussole)	Bussola	Brújula	Kompass
Commutator	Commutateur	Commutatore	Commutador	Stromwender
Commutator (of dynamo)	Collecteur	Collettore	Colector	Kollektor
Component, vertical	Composante verticale	Componente vertical	Componente vertical	Vertikalkomponente
Condenser	Condensateur	Condensatore	Condensador	Kondensator
Condenser, adjustable disc	Condensateur à disque réglable	Condensatore a disco regolabile	Condensador de disco variable	Drehkondensator
Condenser, aerial tuning	Condensateur d'accord d'antenne	Condensatore per la sintonizzazione dell'aereo	Condensador de sintonización de la antena	Antennenspule
Condenser, air	Condensateur à air	Condensatore ad aria	Condensador de dieléctrico de aire	Luftkondensator
Condenser, feed	Condensateur d'alimentation	Condensatore di alimentazione	Condensador de alimentación	Speisekondensator
Condenser, protecting	Condensateur de protection	Condensatore di protezione	Condensador de protección	Schutzkondensator
Condenser, short-wave	Condensateur de raccourcissement	Condensatore per onda corta	Condensador de onda corta	Verkürzungskondensator
Condenser, smoothing	Condensateur r-servoir	Condensatore livellatore	Condensador suavizador	Blockkondensator
Condenser, variable	Condensateur réglable	Condensatore variabile	Condensador variable	Veränderlicher Kondensator
Connection	Connexion	Collegamento	Conexión	Verbindung
Connection, earth	Connexion de terre	Messa a terra	Conexión de tierra	Erdeleitung
Control, remote	Contrôle à distance	Comando a distanza	Mando a distancia	Fernsteuerung (Fernsteuerung)
Converter	Convertisseur	Convertitore	Convertidor	Drehumformer
Co-ordinates, polar	Coordonnées polaires	Coordinate polari	Coordenadas polares	Polarkoordinaten
Coupling	Couplage	Accoppiamento	Acoplo	Kopplung
Coupling, electromagnetic	Couplage électromagnétique	Accoppiamento elettromagnetico	Acoplo electro-magnético	Elektromagnetische Kopplung
Coupling, electrostatic	Couplage électrostatique	Accoppiamento elettrostatico	Acoplo electro-statico	Elektrostatische Kopplung
Couplings, flexible (mech.)	Marchions d'accouplement souples	Accoppiamenti elastici	Acoplamientos flexibles	Biegsame Verbindungen
Couplings, insulating (mech.)	Marchions d'accouplement isolants	Accoppiamenti isolanti	Acoplamientos aisladores	Isolierende Verbindungen
Cross-bearings	Point de recouplement	Rilevamenti incrociati	Marcações cruzadas	Kristall
Crystal	Cristal	Cristallo	Cristal	Strom
Current	Courant	Corrente	Corriente	Wechselstrom
Current, alternating	Courant alternatif	Corrente alternata	Corriente alterna	Gleichstrom
Current, direct	Courant continu	Corrente continua	Corriente continua	Primärstrom
Current, primary	Courant primaire	Corrente primaria	Corriente primaria	Sekundärstrom
Current, secondary	Courant secondaire	Corrente secondaria	Corriente secundaria	Charakteristik
Curve, characteristic	Courbe caractéristique	Caratteristica	Característica	Selbstunterbrecher
Cut-out, automatic	Interrupteur automatique	Interruttore automatico	Interruptor automático	Perioden
Cycles (periods)	Périodes	Periodi	Períodos	—
Damping	Amortissement	Smorzamento	Amortiguamiento	Dämpfung
Detector	Détecteur	Rivelatore	Detector	Detektor
Detector, crystal	Détecteur à cristal	Rivelatore a cristallo	Detector de cristal	Kristalldetektor
Detector, valve	Détecteur à lampe	Rivelatore a valvola	Detector de válvula	Röhrenempfänger
Diagram of connections	Schema des connexions	Schema delle connessioni	Diagrama de conexiones	Schaltschema
Diagram, heart-shaped	Diagramme de réception en forme de cœur	Diagramma a cardiode	Diagrama de corazón	—

Direction-finder	Radiogoniometre	Radiogoniometro	Funkpeiler (or) Radiogonio- meter
Discharger, synchronous	Eclateur synchrone	Scaricatore sincrono	Synchrone Scheibenfunken- strecke
Distortion	Dénaturation	Distorsione	Verzerrung
Dynamo	Dynamo	Dinamo	Dynamo
Earth	Prise de terre	Preso di terra	Erdleitung
Efficiency	Rendement	Rendimento	Wirkungsgrad
Electron	Electron	Elettrone	Elektron
Emission, electronic	Emission d'électrons	Emissione elettronica	Elektronenemission
Ether	Ether	Etere	Aether
Exciter	Excitatrice	Excitatrice	Erreger
Flux, magnetic	Flux magnétique	Flusso magnetico	Magnetische Strömung
Frequency	Fréquence	Frequenza	Frequenz
Frequency, audio	Basse fréquence	Frequenza acustica	Tonfrequenz
Frequency, group	Fréquence des trains d'ondes	Frequenza dei gruppi di seguiti di onde	Wellenzuggruppenfrequenz
Frequency, high	Haute fréquence	Alta frequenza	Hochfrequenz
Frequency, low	Basse fréquence	Bassa frequenza	Niederfrequenz
Frequency, radio	Haute fréquence	Radio frequenza	Radiofrequenz
Frequency, meter (see meter)	Fusible	Fusibile	Schmelzeinsatz
Fuse	Fusible	Fusibile	Schmelzeinsatz
Gap, protecting	Eclateur de protection	Scaricatore di protezione	Blitzschutz-Vorrichtung
Gap, spark	Eclateur à étincelle	Scaricatore	Funkstrecke
Generator	Génératrice	Generatore	Generator
Grid	Grille	Griglia	Gitter
Heterodyne	Hétérodyne	Eterodina	Überlagerung
Impedance	Impédance	Impedanza	Scheinbarer Widerstand
Inductance	Inductance	Induttanza	Induktanz
Inductance, aerial	Inductance d'antenne	Induttanza dell'aereo	Antenneninduktanz
Inductance, aerial tuning	Self d'antenne	Induttanza di sintonia aereo	Antennenspule
Inductance, distributed	Inductance répartie	Induttanza distribuita	Verteilte induktanz
Inductance, high frequency	Bobine d'inductance du circuit à haute fréquence	Induttanza per il circuito di alta frequenza	Hochfrequenz-Induktanzspule
Inductance, low frequency	Bobine d'inductance du circuit à basse fréquence	Induttanza per il circuito di bassa frequenza	Niederfrequenz-Induktanzspule
Inductance, mutual	Inductance mutuelle	Induttanza mutua	Gegenseitige Induktanz
Inductance, primary	Inductance primaire	Induttanza primaria	Primärinduktanz
Inductance, variable	Inductance variable	Induttanza regolabile	Veränderliche Induktanz
Insulation	Isolément	Isolamento	Isolierung
Insulator	Isolateur	Isolatore	Isolator
Insulator, dumbbell	Isolateur en forme d'haltère	Isolatore "dumb-bell"	"Dumbbell" Isolator
Insulator, porcelain	Isolateur en porcelaine	Isolatore di porcellana	Porzellanisolator
Insulator, rod	Stabilisateur	Stabilizzatore	Stabisolator
Insulator, strain	Isolateur tendeur	Isolatore di tensione	Spannisolator
Interference	Interférence	Interferenza	Störung

TECHNICAL VOCABULARY—continued

ENGLISH	FRENCH	ITALIAN	SPANISH	GERMAN
Interference, magneto	Interférence par la magnéto	Interferenza dovuta al magnete	Perturbaciones producidas por la magneto	Magnetomagnetische Störung
Interruptor	Interrupteur	Interruttore	Interruptor	Unterbrecher
Jigger	Jigger	Jigger	Jigger	Jigger
Key, hand or manipulating	Manipulateur	Manipolatore (l'asto)	Manipulador	Taster
Key, high speed	Manipulateur à grande vitesse	Manipolatore a grande velocità	Manipulador de alta velocidad	Schnelltaster
Key, sending	Manipulateur de transmission	Manipolatore di trasmissione	Manipulador de transmisión	Sendetaster
Lamp, tuning and choke	Lampe de syntonisation, avec bobine de réactance	Lampada di sintonizzazione con bobina di reazione	Lámpara de sintonización con bobina de reactancia	Syntonisierlampe mit Impedanz
Leak, grid	Résistance de grille	Resistenza di dispersione di griglia	Resistencia de descarga de rejilla	Gitterwiderstand
Losses, dielectric	Pertes par le diélectrique.	Pérdite nel dielettrico	Pérdidas dieléctricas	Dielektrische Verluste
Loud speaker	Haut-parleur	Alto-parlante (or) Altisonante.	Altoparlante	Lautsprecher
Magnification	Amplification	Amplificazione.	Amplificación	Verstärkung
Magnet	Aimant	Calamita (or) magnete	Imán	Magnet
Mains	Canalisation principale	Linea principale	Linea principal	Hauptleitung
Mast	Mât	Albero	Mástil	Mast
Mast, lattice steel	Pylône en treillis d'acier.	Albero a traliccio in ferro	Mástil de celosía, de acero	Gittermast
Mast, portable	Mât portatif	Albero portatile	Mástil portátil.	Tragbarer Mast
Mast, sectional steel	Mât d'acier à sections	Albero di acciaio diviso in sezioni	Mástil de secciones de acero	Stahlmast in Teilen
Mast, telescopic	Mât télescopique	Albero telescopico	Mástil telescópico	Teleskopmast
Mast, wood	Mât en bois	Albero di legno	Poste de madera	Holzmast
Meter (electricity)	Compteur électrique	Contatore di elettricità	Contador de electricidad	Elektrizitätszähler
Meter, frequency	Fréquencesmètre	Frequenziometro	Microfono	Frequenzmesser
Microphone	Microphone	Microfono	Microfono	Mikrophon
Motor alternator disc set	Groupe moteur alterateur avec écateur à disque	Gruppo convertitore con scariatore a disco	Grupo de motor alternador con estallador de disco	Wechselstromgenerator mit rotierender Funkenstrecke
Night effect	Effet de nuit	Effetto notturno	Efecto nocturno	Nachteffekt
Note	Note	Nota	Nota	Note
Note magnifier	Amplificateur à basse fréquence	Amplificatore di nota (or) Amplificatore di bassa frequenza	Amplificador de baja frecuencia	Niederfrequenzverstärker
Oscillator	Oscillateur	Oscillatore	Oscilador	Oszillator
Oscillator, independent drive.	Oscillateur du circuit d'impulsion indépendant	Oscillatore del circuito di comando	Oscilador independiente de mando	Oszillator des Steuerkreises
Oscillator, independent local	Oscillateur indépendant local	Oscillatore locale indipendente	Oscilador independiente local	Selbstständiger Lokal-Oszillator
Oscillator, power	Oscillateur de puissance	Oscillatore di potenza	Oscilador de potencia	Kraftoszillator
Oscillations, electric	Oscillations électriques	Oscillazioni elettriche	Oscilaciones eléctricas	Elektrische Schwingungen
Overload	Surcharge	Sovracarica	Sobrecarga	Überlast
Panel (see also unit)	Panneau	Quadro (or) Pannello	Tablero (or) Cuadro	Tafel
Panel, control.	Panneau de commande	Quadro (or) Pannello di comando	Cuadro de mando	Schalttafel

Parallel (in)	En paralelo	In parallello	En parallello	Parallel schalten
Phase	Fase	Fase	Fase	Phase
Plant, generating	Impianto generatore	Impianto generatore	Instalación generadora	Stromanlage
Plate	Placa	Placa	Placa	Anode, Platte
Polarisation	Polarizzazione	Polarizzazione	Polarización	Polarisation
Potentiometer	Potenzíometro	Potenzíometro	Potenciómetro.	Potentiometer
Radiation	Rayonnement	Radiatione	Radiación	Strahlung
Radiophare	Radiophare	Radiofaro	Radiofaro	Drablos-Leuchtturm
Radiogoniometer	Radiogoniometre	Radiogoniometro	Radiogoniometro	Radiogoniometer
Range	Portée	Portata	Alcance	Reichweite
Reaction	Réaction	Reattanza	Reactancia	Induktive Widerstand
Receiver	Appareil récepteur	Reazione	Reacción	Reaktion
Receiver, crystal	Récepteur à cristal	Apparecchio ricevitore	Receptor	Empfänger
Receiver, valve	Récepteur à lampe	Ricevitore a cristallo	Receptor de cristal	Detektorempfänger
Rectification	Rectification	Ricevitore a valvola	Receptor de válvula	Röhrenempfänger
Rectifier	Rectificateur	Rettificazione	Rectificación	Gleichrichtung
Reception, beat	Réception à battements	Rectificatore	Rectificador	Gleichrichter
Reflector	Réfecteur	Ricezione a battimenti	Recepción heterodina (or)	Heterodyn-Empfang
Reflexion	Réflexion	Riflettore	Recepción por pulsaciones	Reflektor
Refraction	Réfraction	Riflessione	Reflección	Reflexion
Relay	Relais	Rifrazione	Refracción	Strahlenbrechung
Relay, earthing	Relais de mise à terre	Relais	Relevador (or) Relais	Relais
Relay, signalling	Relais de transmission	Relais di messa a terra	Relevador de puesta a tierra	Erdungsrelais
Resistance	Résistance	Relais di manipolazione	Relevador de manipulación	Tastrelais
Resistance, absorbing	Résistance d'absorption	Resistenza	Resistencia	Widerstand
Resistance, aerial	Résistance de l'antenne	Resistenza di assorbimento	Resistencia de absorción	Absorbierender Widerstand
Resistance, non-inductive	Résistance non-inductive	Resistenza dell'aereo	Resistencia de la antena	Luftdrahtwiderstand
Resistance, regulating	Rhéostat de champ	Resistenza non induttiva	Resistencia no-inductiva	Induktionsfreier Widerstand
Resonance	Résonance	Reostato di campo	Reostato de campo	Feldregler
Rheostat	Rhéostat	Risonanza	Resonancia	Resonanz
Saturation	Saturation	Reostato	Reostato	Rheostat
Screen	Ecran	Saturazione	Saturación	Sättigung
Screen, earth	Contrepoids électrique	Schermo	Pantalla	Schirm
Sense (math.)	Sens.	Schermo di terra	Pantalla de tierra	Gegengewicht
Sense, determination of	Détermination du sens.	Senso	Sentido	Sinn
Series (in)	En série	Determinatione del senso	Determinación del sentido	Sinnbestimmung
Short-circuit	Court-circuit	In serie	En serie	In Reihe schalten
Shunt	Shunt (or) en dérivation	Corto-circuito	Corto-circuito	Kurzschluss
Signals	Signaux	Shunt	Shunt	Shunt
Signals, balancing	Signaux équilibrés	Segnali	Señales	Signale
Signals, loud or strong	Signaux forts	Segnali equilibrati	Señales compensadoras	Balanciersignale
Signals, telephone	Signaux téléphoniques	Segnali forti	Señales fuertes	Starke Signale
Signals, weak	Signaux faibles	Segnali telefonici	Señales telefónicas.	Telephonsignale
Sine law	Loi du sinus	Segnali deboli	Señales débiles	Schwachen Signale
Solenoid	Solénioide.	Legge sinusoidale	Ley sinusoidal	Sinusoidale Gesetz
Spark	Étincelle	Solenoid	Solenoid	Solenoid
Spark, quenched	Étincelle étouffée	Scintilla	Chispa	Funke
		Scintilla smorzata	Chispa extinguida	Löschfunke

TECHNICAL VOCABULARY—continued.

ENGLISH	FRENCH	ITALIAN.	SPANISH	GERMAN
Sparking distance	Distance explosive	Distanza esplosiva	Distancia explosiva	Funkstrecke
Stand-by	Veille (also : Ecoute or Attente)	(Posizione di) Ascolto (or) di attenzione	Escucha (Observación)	Wacht
Starter, automatic	Démarrreur automatique	Avviatore automatico	Reostato de arranque automático	Selbstanlasser
Station, aeroplane	Poste d'avion	Stazione da aeroplano	Estación para aeroplano	Flugzeugstation
Station, airship	Poste d'aéronef (or) Poste de dirigeable	Stazione da aeronave	Estación de aeronave	Luftschiffstation
Station, broadcasting	Station de radiophonie	Stazione di radiodiffusione	Estación de radiodifusión	Rundfunkstelle
Station, high power	Station à grande puissance	Stazione ultrapotente	Estación de gran potencia	Grossstation
Station, portable military	Poste militaire transportable	Stazione militare mobile	Estación militar portátil	Tragbare Militärstation
Station, radiotelegraph	Poste radiotélégraphique	Stazione radiotelegrafica	Estación radiotelegráfica	Funkstation
Station, receiving	Station de réception	Stazione di ricezione	Estación de recepción	Empfangsstation
Station, ship	Station de bord	Stazione di bordo	Estación de a bordo	Schiffstation
Station, transmitting	Station de transmission	Stazione di trasmissione	Estación de transmisión	Sendestation
Supply	Alimentation	Alimentazione	Alimentación	Stromnetz
Switchboard	Tableau de distribution	Quadro di distribuzione	Cuadro de distribución	Schalttafel
Switchboard, control	Tableau de distribution	Quadro di comando	Cuadro de mando	Schalttafel
Switch, aerial change-over	Commutateur d'antenne	Commutatore dell'aereo	Commutador de antena	Luftdrahtumschalter
Switch, automatic	Interrupteur automatique	Interruttore automatico	Interruptor automático	Selbsttätiger Schalter
Switch, double pole	Interrupteur bipolaire	Interruttore bipolare	Interruptor bipolar	Zweipoliger Schalter
Switch, single pole	Interrupteur unipolaire	Interruttore unipolare	Interruptor unipolar	Einpoliger Schalter
Switch, throw-over	Permutateur	Commutatore	Commutador	Umschalter
Switch, main	Interrupteur principal	Interruttore principale	Interruptor principal	Hauptschalter
Switch, quick-break	Interrupteur à rupture brusque	Interruttore a scatto rapido	Interruptor de rotura brusca	Momentschalter
Switch, wave-changing	Commutateur de longueur d'onde	Commutatore d'onda	Commutador de cambio de onda	Wellen-Umschalter
Switch, three-way	Commutateur à trois directions	Commutatore a tre vie	Commutador de tres pasos	Dreivegeschalter
Switch, voltmeter	Interrupteur de voltmètre	Interruttore per voltmetro	Interruptor para voltmetro	Voltmeterumschalter
Telegraphy	Télégraphie	Telegrafia	Telegrafia	Telegraphie
Telephony	Téléphonie	Telefonia	Telefonia	Telephonie
Terminal	Borne	Borna	Borna	Klemme
Terminal, earth	Borne de terre	Borna di terra (or) Messa a terra	Borna de tierra	Erdklemme
Towers, lattice steel	Pylônes en treillis d'acier	Albero a traliccio in ferro	Mástil de celosía, de acero	Gittermast
Transformer	Transformateur	Trasformatore	Transformador	Transformator
Transformer, compensating	Transformateur de compensation	Trasformatore di compensazione	Transformador de compensación	Kompensationstransformator
Transformer, intervalve	Transformateur de couplage entre lampes	Trasformatore intervalvolare	Transformador intervalvular	Hochfrequenz (or) Niederfrequenz Transformator
Transformer, shielded	Transformateur en cage de Faraday	Trasformatore corazzato	Transformador protegido (acorazado)	Käfig-Transformator
Transformer, filament	Transformateur pour filaments	Trasformatore di accensione dei filamenti	Transformador de filamentos	Heiztransformator
Transmission	Transmission	Trasmisione	Transmisión	Sendung
Transmission, beam	Emission par faisceau	Trasmisione a fascio direttivo	Transmisión en haz dirigido	Strahlenbündelendung
Transmission, continuous wave (C.W.)	Emission en ondes entretenues	Trasmisione ad onde persistenti	Transmisión en ondas continuas	Ungedämpfwellen-Sendung

Transmitter, valve . Tritatics . Tube, ebonite . Tuner . Tuning (syntonising) .	Transmetteur à lampes . Câbles de support . Tube en ébonite . Syntonisateur . Syntonisation .	Transmittitore a valvola . Drahge . Tubo di ebanite . Sintonizzatore . Sintonizzazione .	Transmisor de válvulas . Cables de suspensión . Tubo de ebonita . Sintonizador . Sintonización .	wellen-Sendung Unterstützungskabel Ebonitröhre Abstimmapparat Abstimmen
Unit . Unit, control . Unit, modulator . Unit, oscillation . Unit, rectifier . Unit, signalling .	Unité . Appareil de contrôle . Modulateur . Oscillateur . Redresseur . Appareil de manipulation .	Unità . Unità di comando . Unità modulatrice . Unità oscillatrice . Unità rettificatrice . Unità di manipolazione .	Unidad . Unidad (or equipo) de mando . Unidad (or equipo) de modulación . Unidad (or equipo) de oscilación . Unidad (or equipo) de rectificación . Unidad (or equipo) de manipulación .	Einheit Kontrollapparat Modulator Oszillator Gleichrichter Tastapparat
Vacuum . Valve, absorber . Valve, three-electrode . Valve, receiving . Valve, oscillating . Variations, magnetic . Variometer . Voltage . Voltmeter, hot-wire . Voltmeter, moving coil .	Vide . Valve d'absorption . Lampe à trois électrodes . Lampe de réception . Lampe d'émission . Variations magnétiques . Variomètre . Voltage (tension) . Voltmètre thermique . Voltmètre à cadre mobile .	Vuoto . Valvola di assorbimento . Valvola a tre elettrodi . Valvola ricevente . Valvola oscillatrice . Variazioni magnetiche . Variometro . Tensione . Voltmetro a filo caldo . Voltmetro a bobina mobile .	Vacio . Válvula de absorción . Válvula de tres electrodos . Válvula receptora . Válvula osciladora . Variaciones magnéticas . Variometro . Voltaje . Voltmetro térmico . Voltmetro de bobina movable .	Luftleere Absorptionsröhre Dreielektrodenröhre Empfangröhre Senderöhre Magnetische Schwankungen Variometer Spannung Hitzdrahtvoltmeter Drehspulenvoltmeter
Wave, damped . Wave, undamped . Wavelength . Wavemeter . Wire . Wireless telegraphy . Wireless telephony .	Onde amortie . Onde entretenue . Longueur d'onde . Ondemètre . Fil . Radiotélégraphie . Radiotéléphonie .	Onda smorzata . Onda persistente (or) continua . Lunghezza d'onda . Ondametro . Filo . Telegrafia senza fili . Telefonia senza fili .	Onda amortiguada . Onda no amortiguada . Longitud de onda . Ondámetro . Alambre . Telegrafía sin hilos . Telefonia sin hilos .	Gedämpfte Welle Ungedämpfte Welle Wellenlänge Wellenmesser Draht Drahtlose Telegraphie Drahtlose Telephonie

INDUCTANCE OF SINGLE LAYER COILS

$L = \pi^2 D^2 n^2 lk \div 1,000$, microhenries where

$\pi = 3.14$.

D = Diameter of the winding in cms.

n = Number of turns per cm. of winding.

l = Length of the winding in cms.

k = A factor which depends on the ratio of the diameter to the length of the coil.

The values of k for the ratio of length to diameter of the coil between 0.01 and 10 are given in Table 1.

INDUCTANCE AND CAPACITY. TABLE 1.

$\frac{d.}{l}$	K.	$\frac{d.}{l}$	K.	$\frac{d.}{l}$	K.
0.00	1.000	0.48	0.8243	0.94	0.7018
0.02	0.9916	0.50	0.8181	0.96	0.6972
0.04	0.9832	0.52	0.8120	0.98	0.6928
0.06	0.9750	0.54	0.8060	1.00	0.6884
0.08	0.9668	0.56	0.8001	1.20	0.6475
0.10	0.9588	0.58	0.7943	1.40	0.6115
0.12	0.9509	0.60	0.7885	1.60	0.5795
0.14	0.9430	0.62	0.7828	1.80	0.5511
0.16	0.9353	0.64	0.7772	2.00	0.5255
0.18	0.9276	0.66	0.7717	2.2	0.5025
0.20	0.9201	0.68	0.7663	2.4	0.4816
0.22	0.9126	0.70	0.7609	2.6	0.4626
0.24	0.9053	0.72	0.7556	2.8	0.4452
0.26	0.8980	0.74	0.7504	3.0	0.4292
0.28	0.8909	0.76	0.7452	3.5	0.3944
0.30	0.8838	0.78	0.7401	4.0	0.3654
0.32	0.8767	0.80	0.7351	4.5	0.3409
0.34	0.8699	0.82	0.7301	5.0	0.3198
0.36	0.8632	0.84	0.7252	6.0	0.2854
0.38	0.8565	0.86	0.7205	7.0	0.2584
0.40	0.8499	0.88	0.7157	8.0	0.2366
0.42	0.8433	0.90	0.7110	9.0	0.2185
0.44	0.8369	0.92	0.7063	10.0	0.2033
0.46	0.8306				

For making approximate calculations of the inductance of a coil*, Table 2 has been worked out. This table gives the inductance of coils of diameters ranging from 4 to 18 cms. in diameter, and from 1 to 34 cms. long.

The inductance given is for a winding of 10 turns per centimetre. For other windings the values given in the table should be multiplied by $\frac{N^2}{100}$ where N is the number of turns per centimetre.

In Table 3 are given the number of turns per centimetre for coils wound with various covered wires. These figures have been worked out from the diameters given in the catalogue of a leading wire manufacturer, and in many cases checked on actual coils. They must, however be regarded as approximate only, since the number of turns per centimetre depends on the skill of the winder and the overall dimensions of the covered wire, which is not absolutely constant.

Subject to these limitations the table will be found to give very good results for approximate work.

*Nottage, "The Calculation and Measurement of Inductance and Capacity."

TABLE 2
INDUCTANCE OF A COIL WOUND WITH 10 TURNS PER CENTIMETRE.
DIAMETER IN CENTIMETRES.

Length in cms.	4	5	6	7	8	9
1	5.78	7.89	10.14	12.49	14.94	17.47
2	16.59	23.28	30.5	38.1	46.2	54.5
3	29.5	42.25	56.02	70.87	86.57	97.15
4	43.4	63.0	84.57	107.9	132.8	159.0
5	58.0	84.92	115.0	147.6	179.6	220.3
6	72.9	107.6	146.7	190.2	236.2	300.2
7	87.9	130.7	179.3	233.1	291.2	353.7
8	103.3	154.2	212.5	277.2	348.0	423.7
9	118.7	177.8	246.1	322.7	406.0	470.5
10	134.2	201.8	280.0	368.0	464.5	568.5
12	165.2	249.3	348.7	460.5	586.0	717.5
14	196.4	298.2	418.2	554.0	702.5	868.7
16	227.7	347.2	478.8	648.2	825.2	1023
18	259.0	395.7	557.8	743.0	950.0	1178
20	290.5	444.7	628.0	838.0	1074	1333
22	321.7	493.7	698.5	933.5	1205	1490
24	353.5	543.0	752.0	1038.7	1322	1647
26	384.0	591.7	889.0	1125	1447	1845
28	416.5	641.2	910.5	1221	1572	1961
30	448.0	690.2	980.5	1316	1697	2120
32	480.0	739.5	1052	1413	1822	2278
34	511.0	788.7	1122	1509	1948	2380

Length in cms.	10	12	14	16	18
1	20.06	—	—	—	—
2	63.1	81.12	99.7	119.5	139.7
3	120.0	155.8	196.0	233.0	273.7
4	186.3	243.5	305.2	369.5	436.0
5	259.2	342.2	430.7	502.3	620.5
6	337.5	448.2	567.5	698.7	823.7
7	420.2	560.7	711.7	873.2	1046
8	504.0	676.7	863.5	1062	1278
9	590.5	800.7	1020	1256	1512
10	679.5	920.2	1181	1464	1762
12	860.7	1175	1518	1886	2283
14	1046	1435	1862	2329	2822
16	1234	1701	2219	2785	3400
18	1424	1970	2577	3245	3962
20	1615	2241	2945	3715	4547
22	1807	2515	3312	4187	5140
24	2000	2790	3682	4667	5735
26	2194	3067	4057	5152	6342
28	2421	3347	4432	5637	6952
30	2582	3625	4807	6125	7565
32	2778	3905	5187	6615	8182
34	2982	4187	5565	7162	8800

TABLE 3
TURNS PER CENTIMETRE OF VARIOUS GAUGES AND TYPES OF WIRE USED IN
WINDING TUNING COILS.

S.W.G.	Enamelled.	S.S.C.	D.S.C.	S.C.C.	D.C.C.
18	7.8	7.8	7.6	7.3	6.8
20	10.0	10.0	10.0	9.7	8.5
22	13.0	13.0	12.5	10.5	10.0
24	16.5	16.5	15.5	14.0	12.0
26	19.5	19.5	18.5	16.5	14.0
28	24.0	23.5	22.0	19.5	15.5
30	28.5	28.0	26.0	21.0	17.5
32	32.5	32.0	29.5	25.0	19.5
34	38.5	36.5	33.5	27.5	21.5
36	45.5	43.0	40.0	34.0	25.0
38	56.0	51.0	47.0	39.9	28.0
40	71.0	62.5	55.5	44.5	30.5

THE CAPACITY OF FIXED CONDENSERS.

The capacity of a parallel plate fixed condenser is given by

C = (0.0885 KA (N-1)) / t

- where C = the capacity in micro-microfarads,
- k = the dielectric constant (below),
- A = the area of the dielectric under strain (i.e., the area of overlap in square cms.,
- N = the total number of plates,
- t = the distance between the plates in cms.

The value of the dielectric constant (K) may be taken from the table below. The constant of air is taken as unity.

DIELECTRIC CONSTANTS.

SUBSTANCE.	VALUES.	SUBSTANCE.	VALUES.
Glass	4 — 10	Celluloid	7 — 10
Mica	4 — 8	Wood (Maple)	3 — 4.5
Ebonite	2 — 4	Wood (Oak)	3 — 6
Paraffin	2 — 3	Bakelite	5 — 7.5
Paper	1.5 — 4	Castor Oil	4 — 4.7
Shellac	3 — 3.7	Transformer Oil	2 — 2.5
Silk	4.6 — 6	Water (distilled)	81

THE CAPACITY OF VARIABLE CONDENSERS.

With variable condensers of the semi-circular vane type we may write for the capacity

C = (0.139 (N - 1) (R^2 - r^2)) / t x K

- where C = the capacity in micro-microfarads.
- N = the total number of plates.
- R = the radius of the smaller plates (generally the moving plates) in cms.
- r = the radius of the hole in the fixed plates (clearance for the condenser spindle in cms.).
- K = the dielectric constant (see above).
- t = the distance between a fixed and moving plate, i.e., the thickness of the dielectric in cms.

BURNDEPT COILS.

TABLE "A."

PRIMARY AND SINGLE CIRCUIT TUNING.

With average P.M.G. Aerial (100 ft. long, 40-50 ft. high).

Coil No.	Condenser in Series.		Condenser in Parallel.	
	20°	180°	0°	180°
	Metres.	Metres.	Metres.	Metres.
S. 1	160	260	310	380
S. 2	175	290	350	470
S. 3	210	360	430	640
S. 4	270	470	600	900
75	350	570	700	1100
100	450	750	950	1450
150	650	1050	1300	2100
200	900	1450	1900	3000
300	1250	2000	2600	4100
400	1750	2900	3700	5800
500	2600	4300	5500	9000
750	4000	6600	8500	13500
1000	5900	10000	12500	21000

TABLE "B."

SECONDARY TUNING.

Wavelengths given by various settings of Condenser.						Coil No.
0°	20°	60°	100°	140°	180°	
Metres.	Metres.	Metres.	Metres.	Metres.	Metres.	
120	135	200	350	300	330	S. 1
150	170	260	320	375	420	S. 2
210	230	360	440	515	575	S. 3
290	340	500	630	740	810	S. 4
400	450	600	780	900	1000	75
530	600	850	1050	1200	1340	100
740	830	1200	1500	1700	1900	150
1050	1200	1700	2100	2450	2700	200
1400	1600	2400	2950	3400	3800	300
2000	2300	3400	4200	4850	5400	400
3100	3500	5100	6300	7300	8100	500
4800	5400	7900	9800	11300	12500	750
7000	7900	11500	14000	16300	18000	1000

The above figures are correct for Condensers of 0.00075 μ F.

ATLAS COILS.

Coil No.	Wavelength in metres with .001 Variable Condenser in shunt.		Coil No.	Wavelength in metres with .001 Variable Condenser in shunt.	
	Min.	Max.		Min.	Max.
25	120	375	250	1280	4150
35	175	515	300	1550	4940
40	180	650	400	2045	6380
50	230	780	500	2980	8900
65	280	1000	600	4000	12100
75	325	1120	750	4970	15000
100	410	1520	1000	6100	20000
150	660	2300	1250	7000	22000
200	850	3100	1500	8200	26000

IGRANIC COILS.

No. of Turns.	True Inductance Microhenries.	Distributed Capacity Microfarads.	Wavelengths in Metres when shunted by CONDENSERS.	
			0.0005 mfd.	0.001 mfd.
25	30.2	26	60—230	60—330
35	60.3	34	85—340	85—470
50	134	47	150—500	150—700
75	297	38	200—750	200—1050
100	517	43	280—1000	280—1350
150	1151	31	360—1450	360—2050
200	2150	28	470—2000	470—2800
250	3480	22	530—2500	530—3500
300	4980	27	700—3000	700—4200
400	8980	26	900—4000	900—5700
500	14510	25	1150—5200	1150—7250
600	20110	25	1350—6100	1350—8500
750	32300	22	1600—7700	1600—10800
1000	59740	22	2200—10400	2200—14700
1250	91830	22	2700—13000	2700—18200
1500	136400	21	3200—15900	3200—22200

WAVELENGTH AND FREQUENCY OF RESONANCE.

$$\begin{aligned}\lambda_{cm} &= 1.8838 \times 10^{11} \sqrt{LC} \text{ (cgs. electromagnetic units).} \\ &= 6.283 \sqrt{L \text{ cgs. electromagnetic } C \text{ cgs. electrostatic.}} \\ \lambda_m &= 0.05957 \sqrt{L \text{ cgs. electromagnetic } C \text{ micromicrofarad}} \\ &= 1.884 \sqrt{L \text{ microhenry } C \text{ micromicrofarad.}} \\ &= 1884 \sqrt{L \text{ microhenry } C \text{ microfarad.}} \\ &= 59570 \sqrt{L \text{ millihenry } C \text{ microfarad.}} \\ &= 1884000 \sqrt{L \text{ henry } C \text{ microfarad.}} \\ f &= \frac{159.2}{\sqrt{L \text{ henry } C \text{ microfarad.}}} \\ f &= \frac{5033}{\sqrt{L \text{ millihenry } C \text{ microfarad.}}} \\ f &= \frac{159200}{\sqrt{L \text{ microhenry } C \text{ microfarad.}}}\end{aligned}$$

BRITISH ASSOCIATION SCREW THREADS.

$$\begin{aligned}P &= \text{pitch} = \frac{1}{\text{No. of threads per inch.}} \\ D &= \text{depth} = P \times .6 \\ R &= \text{radius} = \frac{2 \times P}{11}\end{aligned}$$

No.	Diameter.		No. of Threads.		Depth of Thread.	Double Depth of Thread.
	mm.	Inches.	Per in.	Per cm.	Inches.	Inches.
0	6.0	.236	25.4	10.0	.0236	.0472
1	5.3	.209	28.2	11.1	.0212	.0425
2	4.7	.185	31.3	12.3	.0191	.0383
3	4.1	.161	34.8	13.7	.0172	.0345
4	3.6	.142	38.5	15.1	.0156	.0312
5	3.2	.126	43.0	17.0	.0139	.0279
6	2.8	.110	47.9	18.9	.0125	.0250
7	2.5	.098	52.9	20.8	.0113	.0227
8	2.2	.087	59.0	23.2	.0101	.0203
9	1.9	.075	65.1	25.6	.0092	.0184
10	1.7	.067	72.5	28.6	.0083	.0165

SIZES OF MORSE DRILLS IN DECIMALS OF AN INCH.

No.	Dia.	No.	Dia.	No.	Dia.	No.	Dia.	No.	Dia.	No.	Dia.
80	.0135	64	.036	48	.076	32	.116	16	.177	A	.234
79	.0145	63	.037	47	.0785	31	.120	15	.180	B	.238
78	.016	62	.038	46	.081	30	.1285	14	.182	C	.242
77	.018	61	.039	45	.082	29	.136	13	.185	D	.246
76	.020	60	.040	44	.086	28	.1405	12	.189	E	.250
75	.021	59	.041	43	.089	27	.144	11	.191	F	.257
74	.0225	58	.042	42	.0935	26	.147	10	.1935	G	.261
73	.024	57	.043	41	.096	25	.1495	9	.196	H	.266
72	.025	56	.0465	40	.098	24	.152	8	.199	I	.272
71	.026	55	.052	39	.0995	23	.154	7	.201	J	.277
70	.028	54	.055	38	.1015	22	.157	6	.204	K	.281
69	.0293	53	.0595	37	.104	21	.159	5	.2055	L	.290
68	.031	52	.0635	36	.1065	20	.161	4	.209	M	.295
67	.032	51	.067	35	.110	19	.166	3	.213	N	.302
66	.033	50	.070	34	.111	18	.1695	2	.221	O	.316
65	.035	49	.073	33	.113	17	.173	1	.228	P	.323

GRAPHICAL SYMBOLS FOR WIRELESS DIAGRAMS.



Aerial—Elevated.



Aerial—Horizontal or Buried.



Aerial—Directional.



Terminal.



Wires—Twisted Pair.



Connection—Electrical Joint.



Bridge—Crossing.



Earth.



Counterpoise.



Cell. (The long thin stroke represents the Positive Terminal.)



Battery—L.T.



Battery—H.T.



Condenser—Large, Audio Frequency.



Condenser—Fixed Radio Frequency.



Condenser—Variable (continuously) Radio Frequency.



Telephones.



Telephone—Loud Speaking.



Microphone—Telephone Transmitter.



Link.



Fuse.



Switch—Single-way.



Switch—Multi-way.



Switch—Plug.



Plug.



Key—Morse Tapping.



Key—Morse, Back Contact.



Relay.



Detector—Crystal.



Coherer.



Tikker.



Detector—Magnetic.



Rectifier. (Electron Current Flow assumed from Point to Plate.)



Vacuum Tube—Non-filament.



Valve—Tube Thermionic.



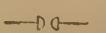
Valve Tube—Thermionic, 3-Electrode.



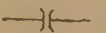
Valve—Tube Thermionic, 4-Electrode.



Lamp—Bulb Electric Filament



Spark Gap—Open.



Spark Gap—Quenched.














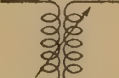



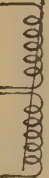



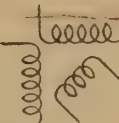















Spark Gap—Rotary, Synchronous.



Spark Gap—Rotary, Asynchronous.



Lightning Arrester.

	Arc—Open.		Inductance—Variable.
	Arc—Enclosed.		Direction—From.
	Arc—Generator.		Direction—Towards.
	Generator—D.C.		Direction.
	Generator—Alternating.		Coupling—Inductive.
	Motor.		Coupling—Inductive, Variable.
	Coupling—Mechanical.		Coupling—Inductive, Variable, one Inductance Variable.
	Ammeter.		Coupling—Inductive, Variable (Alternative).
	Milliammeter.		Variometer.
	Microammeter.		Radiogoniometer.
	Voltmeter.		Transformer—Iron Core.
	Galvanometer.		Coupling—Autotransformer.
	Decremeter.		Choke Coil—Iron Core.
	Wattmeter.		Inductance.
	Frequencymeter.		Vibrator—Buzzer Make and Break.
	Microfaradmeter.		
	Wavemeter.		
	Thermoammeter.		
	Resistance—Fixed.		
	Resistance—Variable.		

THE MORSE CODE

Two forms of Morse Code are in use, the "Continental Morse Code." and the "American Morse Code." The latter is now only officially recognised for use in land line telegraphs in America, so that the Continental Code is used universally in Radio work.

Continental Morse is a dot and dash system, every letter or symbol consisting of a combination of these. Considering as an element either a dot or a dash, no ordinary unaccented letter is represented by more than four elements. Some punctuation signs, numerals and whole words are represented by more than four elements.

Rules for formation of Continental Morse code :

These rules apply irrespective of the speed of transmission.

(1) The time occupied by a dash should be equal to that occupied by three dots.

(2) The time occupied by the interval between two elements of one letter or other symbol should be equal to the time occupied by one dot.

(3) The interval between two letters in a word should be equal to the time occupied by three dots.

(4) The interval between two words should be equal to the time occupied by five dots.

Letters.

CONTINENTAL MORSE.

a	• —
ä	• — • —
á } à }	• — — • —
b	— • • •
c	— • — •
ch	— — — —
d	— • •
e	•
é	• • — • •
f	• • — •
g	— — •
h	• • • •
i	• •
j	• — — —
k	— • —
l	• — • •

m	— —
n	— •
ñ	— — • — —
o	— — —
ö	— — — •
p	• — — •
q	— — • —
r	• — •
s	• • •
t	—
u	• • —
ü	• • — —
v	• • • —
w	• — —
x	— • • —
y	— • — —
z	— — • •

Figures.

CONTINENTAL MORSE.

1	• — — — —	6	— • • • •
2	• • — — —	7	— — • • •
3	• • • — —	8	— — — • •
4	• • • • —	9	— — — — •
5	• • • • •	0	— — — — —

Abbreviated Continental Morse Figures.

1	• —	6	— • • • •
2	• • —	7	— • • •
3	• • • —	8	— • •
4	• • • • —	9	— •
5	• • • • •	0	—

Punctuation and Other Signs.

CONTINENTAL MORSE.

Full stop	..	..	..	..	..	(.)	• • • • •
Semicolon	..	..	..	..	..	(;)	— • — • — •
Colon	..	..	..	..	..	(:)	— — — • • •
Comma	..	..	..	..	..	(,)	• — • — • —
Note of interrogation, or, request for a repetition	..	..	..	..	..	(?)	• • — — • •
Note of exclamation	..	..	..	..	..	(!)	— — • • — —
Apostrophe	..	..	..	..	..	(')	• — — — •
Hyphen or dash	..	..	..	..	..	(-)	— • • • • —
Fractional bar	..	..	..	..	..	(/)	— • • — •
Brackets. <i>This sign must be made both before and after the words which are to be bracketed</i>						()	— • — — • —
Inverted commas. <i>Must be made before and after the words which are to be quoted</i>	..					(" ")	• — • • — •
Underline. <i>Must be made before and after words which are to be underlined</i>	..						• • — — • —
Preliminary call. <i>To precede every transmission</i>	..	..	..	..	..		— • — • —
Double dash. <i>Generally called the "break sign." The signal separating preamble from address, address from text and text from signature</i>	..	..	..	..	..	(=)	— • • • —
End of message	..	..	..	..	..		• — • — •
Error. <i>Means, "Erase." Some operators, however, use the repetition signal</i>	..						• • • • •
Invitation to transmit	..	..	..	..	..		— • —
Wait	..	..	..	..	..	(AS)	• — • • •
Received "signal	..	..	..	..	..		• — •
Distress call. <i>Formerly CQD</i>	..	..	..	..	..	(SOS)	• • • — — • • •
All stations "	..	..	..	..	..	(CQ)	— • — • — — • —
End of Work	..	..	..	..	..	(SK)	• • • — • —

Punctuation and Other Signs.

AMERICAN MORSE.

Full stop	..	..	..	..	..	(.)	• • — — • •
Semicolon	..	..	..	..	..	(;)	• • • • •
Colon	..	..	..	..	..	(:)	— • — • •
Comma	..	..	..	..	..	(,)	• — • —
Note of interrogation		..	..	..	..	(?)	— • • — •
Note of exclamation	..	..	..	..	..	(!)	— — — •
Apostrophe	..	..	..	..	..	(')	• • — • • — • •
Hyphen	..	..	..	..	..	(-)	• • • • • — • •
Dash	..	..	..	..	..	(—)	— • • • — • •
Fractional bar	..	..	..	..	..	(/)	•
Bracket (begin)	..	..	..	..	..	( ( )	• • • • • — •
Bracket (end)	..	..	..	..	..	( ) )	• • • • • • • •
Inverted commas (begin)	..	..	..	..	..	(“	• • — • — •
Inverted commas (end)	..	..	..	..	..	”)	• • — • — • — •
Underline (begin)	..	..	..	..	..		• • — • — • •
Underline (end)	..	..	..	..	..		• • — — • — •
Dollars	..	..	..	..	..	(\$)	• • • • — • •
Pounds (sterling)	..	..	..	..	..	(£)	• • • • • • — • •
Capital Letter	..	..	..	..	..		• • • • • — • •
Decimal point	..	..	..	..	..	(DOT)	— • • • • —
Paragraph	..	..	..	..	..	(¶)	— — — —
Per cent.	..	..	..	..	..		— — • — —
&		• • • •

The following are extracted from the International Convention on Safety of Life at Sea :—

ARTICLE II.

SAFETY SIGNAL.

The radiotelegraph stations which have to transmit to ships information involving safety of navigation and being of an urgent character (icebergs, derelicts, cyclones, typhoons, sudden changes in the position or form of fixed obstructions or of land marks) shall make use of the following signal, called the safety signal, repeated at short intervals ten times at full power :

— — — (T T T)

In principle, all radiotelegraph stations receiving the safety signal shall, if the transmission of messages by them would interfere with the receipt by any other station of the safety signal and the following safety message, keep silence, in order to allow all interested stations to receive that message. This does not apply to cases of distress.

The safety message shall be transmitted one minute after the safety signal has been sent out, and shall be repeated thereafter three times at intervals of ten minutes.

The Governments of the Contracting States will select the stations which are to send out to mariners safety information of an urgent character.

When the information in question has been sent out by stations performing the time service, it shall be again sent out after the transmission of the time signal and the weather report.

ARTICLE III.
MORSE CODE.
INTERNATIONAL SIGNALS.

These signals may be made at night or in thick weather, either by long and short flashes of light, or by long and short sound signals (whistles, fog-horns, etc.), or during the day by hand flags.

1.—URGENT AND IMPORTANT SIGNALS.

You are standing into danger..	..	..	• • —
I want assistance : remain by me	..	..	• • • —
Have encountered ice	..	..	• — —
Your lights are out (<i>or</i> , burning badly)	..	..	• — — •
The way is off my ship ; you may feel your way past me	..	..	• — •
Stop (<i>or</i> , heave to) ; I have something important to communicate	..	..	• — • •
Am disabled ; communicate with me	..	..	• • — •

2.—GENERAL SIGNALS.

Meaning.	Signal.	Equivalent Letters and How Made.	How Answered.
Preparative ..	• • • • • &c.	A succession of E's in one group	By the general answer T.
Answer	—	T (singly)	
Spelling	• • — • • • — •	F F in one group	By the general answer T.
Use International Code of Signals	— — — — —	M M M in one group	By the general answer T.
International Code Flag sign	— — — — —	M M in one group	
Break sign	• • • •	I I as separate letters	
Stop	• • • • •	I I I as separate letters	
Finish of the message	• • • — •	V E as one group	• — • R. — • • D. As separate letters.
Erase sign	• • • • &c.	A succession of E's as separate letters	By a succession of E's as separate letters.
Annul	W W • — — • — —	W W as one group	By W W as one group.
Repeat word after : (when a single word is required)	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> I M I • • — — • • W A • — — • — — </div> <div> Followed by the word preceding the one required </div> </div>	I M I as one group W A as separate letters	By the general answer T.
Repeat all after : (if more than one word is required)	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> I M I • • — — • • A A • — — • — — </div> <div></div> </div>	I M I as one group A A as separate letters	By the general answer T.
Repeat all : (if the whole message is to be repeated)	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> I M I • • — — • • A L L • — — • — — </div> <div></div> </div>	I M I as one group A L L as separate letters	By the general answer T.

3.—NATIONALITY SIGNALS.

Meaning.	Signal.	Equivalent Letters and How Made.
American	— • — • — •	C D as separate letters.
Argentine	— • — • — •	C G " "
Austro-Hungarian	— • — • — •	C F " "
Belgian	— • — • — •	D C " "
Brazilian	— • — • — •	D E " "
British	— • — • — •	F.
Bulgarian	— • — • — •	D F as separate letters.
Chilian	— • — • — •	D G " "
Chinese	— • — • — •	E C " "
Colombian	— • — • — •	E D " "
Danish	— • — • — •	E F " "
Dutch	— • — • — •	E G " "
French	— • — • — •	E.
German	— • — • — •	G.
Greek	— • — • — •	M M in one group followed by D.
Italian	— • — • — •	C E as separate letters.
Japanese	— • — • — •	C.
Mexican	— • — • — •	F C as separate letters.
Norwegian	— • — • — •	M M in one group followed by C.
Peruvian	— • — • — •	F D as separate letters.
Portuguese	— • — • — •	F E " "
Russian	— • — • — •	D.
Siamese	— • — • — •	F G as separate letters.
Spanish	— • — • — •	G C " "
Swedish	— • — • — •	M M in one group followed by E.
Turkish	— • — • — •	G D as separate letters
Uruguayan	— • — • — •	G E " "
Venezuelan	— • — • — •	G F " "

4.—INSTRUCTIONS.

1. THE URGENT AND IMPORTANT SIGNALS may be made without the Preparative Signal being answered if it is supposed that the person addressed cannot reply, or in other special circumstances; but in this case a pause should be made between the Preparative Signal and the message.

2. THE SIGNAL • • — • • — • (FF) is used previous to any letters which are intended to spell words.

3. THE SIGNAL — — — — — (MMM) is used previous to any messages sent by means of the International Code of Signals.

4. THE SIGNAL — — — — — (MM) means the Code Flag of the International Code of Signals, and is used as indicated in the Code Book.

5. THE BREAK SIGN is used between the address of the receiver and the text of the message, and after the message if the name of the sender is to be signalled.

6. THE STOP is used, where necessary, in the text of the signal.

7. THE ERASE is used to cancel the last word or signal group, sent by mistake.

8. THE ANNUL is used to cancel *all* the message.

9. METHOD OF ANSWERING. Each word or signal group when understood, is to be answered by one long flash — (T).

If a word or signal group is not answered, the sender is to repeat it until answered by a long flash.

At the end of the message, if understood, the receiver will make • — • — • • (RD).

The Erase and Annul signals are to be answered by their own signs.

10. THE NATIONALITY SIGNAL is made immediately after the answer to the Preparatory Signal has been received, to indicate the nationality of the vessel making the signal. It is answered by the nationality signal of the vessel receiving the message.

The following are extracted from the International Radiotelegraphic Convention.

APPENDIX.

II.

LIST OF ABBREVIATIONS TO BE USED IN RADIOTELEGRAPH TRANSMISSIONS.

Abbrevia- tion. 1.	Question. 2.	Answer or Advice. 3.
— • — • — • — • (CQ)	.. .. .	Inquiry signal employed by a station which desires to correspond.
— • — • (TR)	.. .. .	Signal announcing the sending of indications concerning a ship station (Article XXVIII).
— — • • — — (I)	.. .. .	Signal indicating that a station is about to send with high power.
PRB	Do you wish to communicate with my station by means of the International Signal Code?	I wish to communicate with your station by means of International Signal Code.
QRA	What is the name of your station?	This station is.....
QRB	How far are you from my station?	The distance between our station is..... nautical miles.
QRC	What are your true bearings?	My true bearings are.....degrees.
QRD	Where are you bound?	I am bound for.....
QRF	Where are you coming from?	I am coming from.....
QRG	To what company or line of navigation do you belong?	I belong to.....
QRH	What is your wavelength?	My wavelength is.....metres.
QRJ	How many words have you to transmit?	I have.....words to transmit
QRK	How are you receiving?	I am receiving well.
QRL	Are you receiving badly? Shall I transmit 20 times • • • — • so that you can adjust your apparatus	I am receiving badly. Transmit 20 times • • • — • so that I can adjust apparatus.
QRM	Are you disturbed?	I am disturbed.
QRN	Are the atmospherics very strong?	The atmospherics are very strong.
QRO	Shall I increase my power?	Increase your power.
QRP	Shall I decrease my power?	Decrease your power.
QRQ	Shall I transmit faster?	Transmit faster.
QRS	Shall I transmit more slowly?	Transmit more slowly.
QRT	Shall I stop transmitting?	Stop transmitting.
QRU	—	I have nothing to transmit.
QRV	Are you ready?	I have nothing for you.
QRW	Are you busy?	I am ready. All is in order.
QRX	Shall I wait?	I am busy with another station (or with please do not interrupt).
QRY	What is my turn?	Wait. I will call you at.....o'clock (or when I want you).
QRZ	Are my signals weak?	Your turn is No.
QSA	Are my signals strong?	Your signals are weak.
QSB	Is my tone bad?	Your signals are strong.
QSC	Is my spark bad?	The tone is bad.
QSD	Is the spacing bad?	The spark is bad.
QSF	Let us compare watches. My time is What is your time?	The spacing is bad.
QSG	Are the radiotelegrams to be transmitted alternately or in series?	The time is.....
QSH	—	Transmission will be in alternate order.
QSJ	What is the charge to collect for.....?	Transmission will be in series of five radiotelegrams.
QSK	Is the last radiotelegram cancelled?	Transmission will be in series of ten radiotelegrams.
QSL	Have you got the receipt?	The charge to collect is.....
QSM	What is your true course?	The last radiotelegram is cancelled.
QSN	Are you communicating with land?	Please give a receipt.
QSO	Are you in communication with another station (or with.....)?	My true course is.....degrees.
QSP	Shall I signal to that you are calling him?	I am not communicating with land.
		I am in communication with (through the medium of.....).
		Inform that I am calling him.

Abbrevia- tion. 1.	Question. 2.	Answer or Advice. 3.
QSO	Am I being called by.....? ..	You are being called by.....
QSR	Will you dispatch the radiotelegram?	I will forward the radiotelegram.
QST	Have you received a general call? ..	General call to all stations.
QSU	Please call me when you have finished (or at.....o'clock)	I will call you when I have finished.
QSV	Is public correspondence engaged? ..	Public correspondence is engaged. Please do not interrupt.
QSW	May I increase the frequency of my spark?	Increase the frequency of your spark.
QSX	Must I diminish the frequency of my spark?	Diminish the frequency of your spark.
QSY	Shall I transmit with a wavelength of.....metres?	Let us transfer to the wavelength of.... metres.
QSZ	.. .. .	Transmit each word twice. I have diffi- culty in receiving your signals.
QTA	.. .. .	Transmit each radiotelegram twice. I have difficulty in reading your signals, or Repeat the radiotelegram you have just sent. Reception doubtful.
QTB	.. .. .	Number of words not agreed; I will repeat first letter of each word and first figure of each group.
QTC	Have you anything to transmit? ..	I have something to transmit. I have one (or several) radiotelegrams for

When an abbreviation is followed by a mark of interrogation it applies to the question indicated in respect of that abbreviation.

In addition to these signals, which, it will be observed, are uniform in construction, the following signals of the International Telegraph Code may be used in these communications:—

• • — • • "Repeat" sign (as well as mark of interrogation).
• • • — • Understood.
• — • • • Wait.

EXAMPLES.

Station.						
A	QRA?	..	..	..	..	What is the name of your station?
B	QRA	Campania	..	..	..	This is the Campania.
A	QRG?	..	..	..	..	To what company or line of navigation do you belong?
B	QRG	Cunard. QRZ	..	..	..	I belong to the Cunard Line. Your signals are weak.
Station A then increases the power of its transmitter and sends:—						
A	QRK?	..	..	..	..	How are you receiving?
B	QRK	..	..	..	..	I am receiving well.
	QRB	80	..	..	..	The distance between our stations is 80 nautical miles.
	QRC	62	..	..	..	My true bearings are 62 degrees, etc.

VALVE PATENTS FOR 1924.

By W. H. NOTTAGE, B.Sc., A.M.I.E.E., F.Inst.P.

British No. **183,130**. By TELEFUNKEN GESELLSCHAFT FUR DRAHTLOSE TELEGRAPHIE, m.b.H.

This is for a receiving circuit wherein the incoming oscillations are caused to start the generation of oscillations in a circuit tuned to a frequency different to and independent of that of the signals.

One method described consists in rectifying the incoming signals and employing the rectified current to apply a positive potential to the grid of a valve which is connected as a generator.

The grid has a steady negative potential applied by a battery sufficient to prevent the generation of oscillations until the potential due to the rectified signals is applied when the oscillations are started. If these are of low frequency they may be received directly in a telephone.

British No. **183,838**. By BRITISH THOMSON-HOUSTON CO., LTD. (Assignees of C. W. Rice).

This is a valve receiver circuit in which the signals received by the aerial are impressed upon an artificial transmission line which preferably has an effective length equal to a plurality of wavelengths of the signals to be received.

The grid circuits of a number of thermionic valves are connected to different points along the line situated so that they are a wavelength or a multiple of wavelengths of the signals apart. The anode circuits of these valves are all connected so that the output current will have an amplitude which is the sum of the amplitudes due to each valve circuit by itself.

Signals of different frequency or atmospheric disturbances will not be impressed on the grid circuits in phase, and hence will give an output current less than the sum of the amplitudes which each valve circuit in itself would give.

British No. **185,752**. By BRITISH THOMSON-HOUSTON CO., LTD. (Assignees of A. W. Hull).

This patent is for an improved method of working a "magnetron" type of valve, which is provided with a grid, and wherein the magnetic field

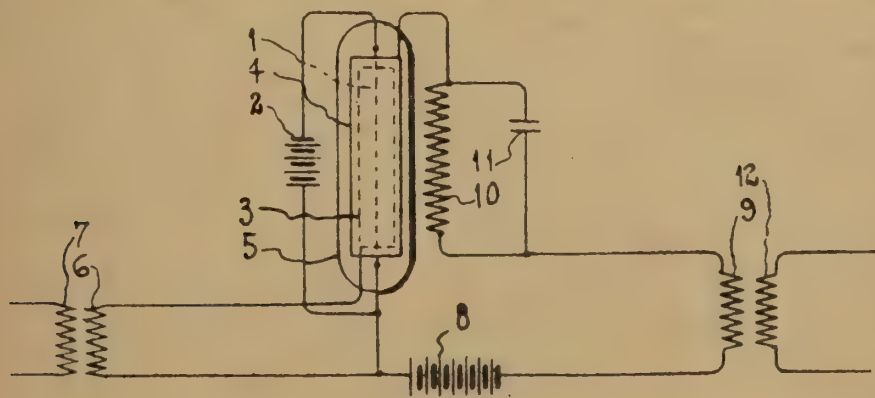


Fig. 1.

is due to the thermionic current between cathode and anode of the valve, which is caused to flow in a coil placed round the bulb.

The current is kept at a substantially constant critical value, in which way the sensitiveness of the grid control is greatly improved and the slope of the grid potential/anode current curve for a certain range is greatly increased over the normal value given when there is no magnetic field.

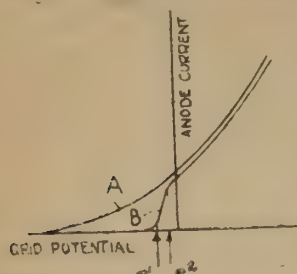


Fig. 2.

A circuit wherein the invention is utilised is shown in Fig. 1, and the characteristic is shown in Fig. 2, where curve A shows the curve without magnetic field, and curve B that with a magnetic field.

The latter has a very sharp bend which would render the action of the device as a rectifier for reception of signals much more sensitive.

British No. **186,070**. By BRITISH THOMSON-HOUSTON CO., LTD. (Assignees of E. F. W. Alexanderson).

The most usual method in using valve generators for radio signalling is to couple the oscillation generator tightly to the transmitting circuit, and by controlling either the grid or plate potential of the valve, to modulate the current supplied to the transmitting circuit in accordance with the signals.

In the present arrangement the valve generator is coupled fairly loosely to the aerial or other transmission circuit, and in order to control the current supplied to the latter the coupling is varied in accordance with the signals by shunting the coupling coil with a magnetic amplifier.

When the current supplied to the transmitting circuit falls to a minimum the counter electromotive force generated in the oscillation circuit of the generator will increase slightly in place of falling largely as in the older circuits. By this means the oscillation circuit works at high efficiency.

British No. **187,986**. By BRITISH THOMSON-HOUSTON CO., LTD. (Assignees of E. F. W. Alexanderson).

This invention proposes to utilise the phase relationship between signals and disturbances to eliminate the latter in a receiving circuit.

According to the invention, the signals to be received are applied both to the grid and anode circuits of a thermionic valve, and the grid circuit is provided with a phase rotator for the purpose of adjusting the current therein so that it will be in phase with that in the anode circuit, which need not have an anode battery. Preferably the grid is given a negative bias by means of a battery.

Atmospheric disturbances which are not in phase with the signalling currents will not pass through the valve unless they are of many times the strength of the signals.

The arrangement may be applied to the high-frequency signals, to low-frequency signals produced by a detector, or the signals in grid and anode circuits may be obtained from separate aerial systems having different characteristics.

British No. **187,992**. By SIEMENS & HALSKE, A.-G.

This describes a vacuum tube especially for measuring purposes, the construction of which is designed to give a very high resistance between the grid and the other electrodes. For this purpose the grid connection is brought out at the opposite end of the tube to where the anode and cathode connections are placed. Moreover the grid connection is sealed into a re-entrant tube closed at its outer end by an amber or other high grade insulating plug. The inner wall of the hollow space thus formed is maintained at a high state of insulation by the use of drying agents, coating it with bakelite, or by evacuating it.

British No. **189,125**. By BRITISH THOMSON-HOUSTON CO., LTD. (Assignees of A. W. Hull.)

This invention comprises a new type of magnetically controlled electron discharge device.

In the ordinary type of magnetron a heated cathode and anode are placed in an evacuated tube designed so that it may be placed in a coil carrying a current whereby a magnetic field is produced in the space between the electrodes. Above a certain critical value of field the thermionic current is greatly reduced and may be quite interrupted.

The current employed to heat the cathode will also produce a magnetic field, but in the usual types of magnetron the effect of this field on the thermionic current is negligible. If the cathode be made of relatively large diameter it will require a correspondingly large current to heat it to a temperature suitable for giving the requisite thermionic current, and as the diameter of the cathode increases beyond seven mils., the magnetic field due to this current has an appreciable controlling effect on the thermionic emission. For diameters much larger than this the emission may be cut off entirely.

The present invention concerns a magnetron of this type, and arrangements in which it may be utilised.

Fig. 3 shows the relationship between the heating current and electron current, with a given voltage applied between cathode and anode. Up to a current with a given value C_1 the electron current between cathode and anode is practically unaffected. As the current is increased beyond C_1 the electron current is rapidly reduced, until at C_2 it is cut off.

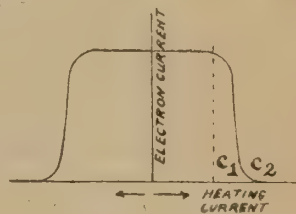


Fig. 3.

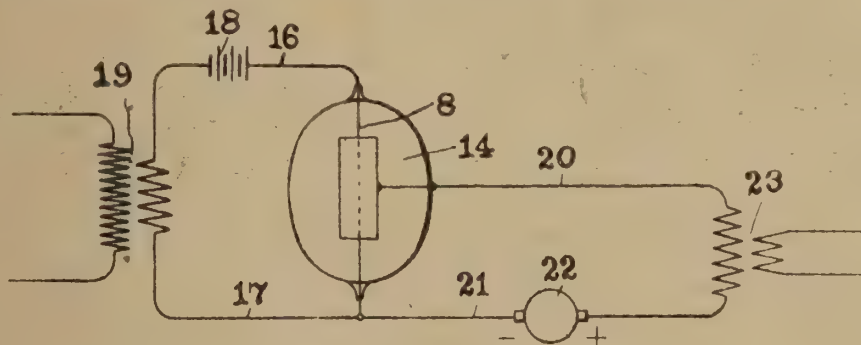


Fig. 4.

Fig. 4 shows how this property may be utilised to amplify a variable current. The input circuit (16, 17) includes a direct current source (18), and an alternating current transformer (19). The output circuit contains a source of direct current (22) and a transformer (23) or other consuming device.

The current furnished by 18 is adjusted to effectively reduce the thermionic current, so that when the alternating current is in the same direction as that from battery 18 the thermionic current is interrupted, but when the currents are opposed the maximum thermionic current flows.

Circuits for using the new type of magnetron to rectify alternating current or to generate high frequency currents are also given. In the former case the cathode circuit includes a synchronous commutator to cut off the cathode current during every alternate half cycle, when the anode is positive with respect thereto. The cathode remains at a sufficiently high temperature to allow of a thermionic current flowing.

From the dimensions of the cathode and the current necessary to heat it, it will be seen that this type of magnetron can only work in high power units, and actually devices capable of dealing with 1,000 kilowatts have been constructed.

British No. **189,135**. By BRITISH THOMSON-HOUSTON CO., LTD. (Assignees of A. W. Hull.)

This invention also concerns a magnetron of the type where the magnetic field is produced by the current flowing in the cathode. In this type, however, the cathode is a coiled filament, and it surrounds the anode, which is a straight wire. The device may be used for generating oscillations, detecting or amplifying signals.

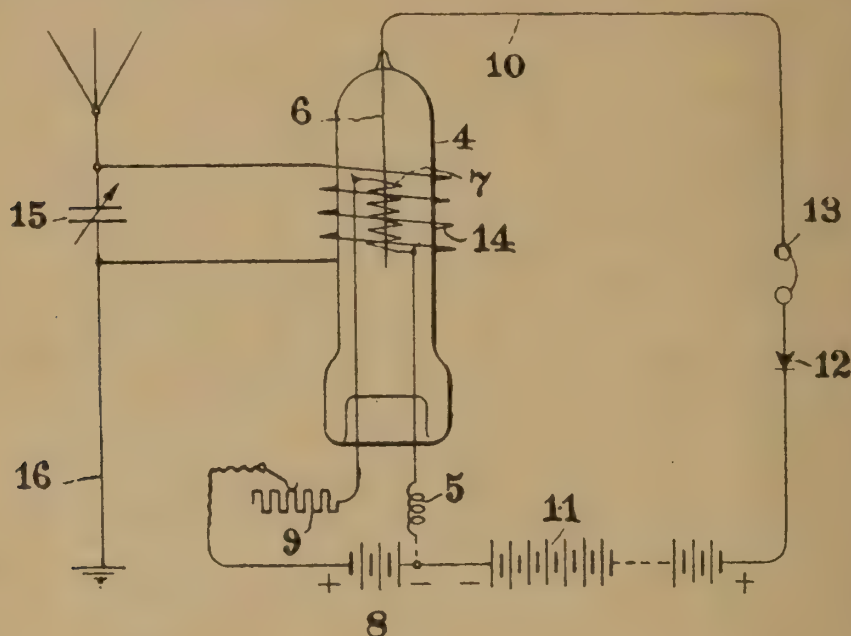


Fig. 5.

Fig. 5 shows the application to amplifying signals received by an aerial. The cathode is designed so that the current necessary to produce a suitable thermionic emission will create a magnetic field, so that this emission is substantially reduced from the maximum possible value. The oscillations received by the aerial (16) flow through the coil (14) and produce a magnetic field in the space between the electrodes.

When this field opposes that due to the cathode current the thermionic current will increase, and on the high frequency field reversing the current will be reduced. The arrangement can thus act as a high frequency amplifier, and the amplified oscillations may be rectified by a crystal (12) and perceived in a telephone (13).

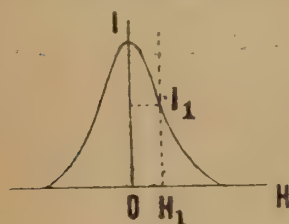


Fig. 6.

Fig. 6 shows the relation between thermionic current (I) and magnetic field (H). The cathode current is arranged so as to produce a field of magnitude H_1 , when the thermionic current will be reduced to I_1 .

In place of using the cathode current to produce the magnetic field, the current in the anode circuit may be employed for the purpose. In this case the anode is formed as a circular coil surrounding the cathode, and if it be made in the form of a copper tube it may be cooled by a circulation of water through it.

British No. **191,033**. By BRITISH THOMSON-HOUSTON CO., LTD. (Assignees of A. W. Hull.)

This patent is concerned with an amplifier circuit employing a four electrode valve, the electrodes being a cathode, grid, a second grid-like electrode, and an anode.

The electrodes are arranged concentrically, the second grid-like electrode being formed of a number of slats arranged so that the greater number of

primary electrons emitted from the cathode strike the slat electrode and produce an emission of impact electrons greater than the primary emission.

If the slats are arranged radially about the cathode a magnetic field is produced in the space between the electrodes to deflect the electrons emitted from the cathode on to the slats. The slats may, however, be arranged at an angle to the radial direction, in which case the magnetic field may not be necessary. The magnetic field may be produced by a coil surrounding the tube and through which the current to the anode from the anode battery passes.

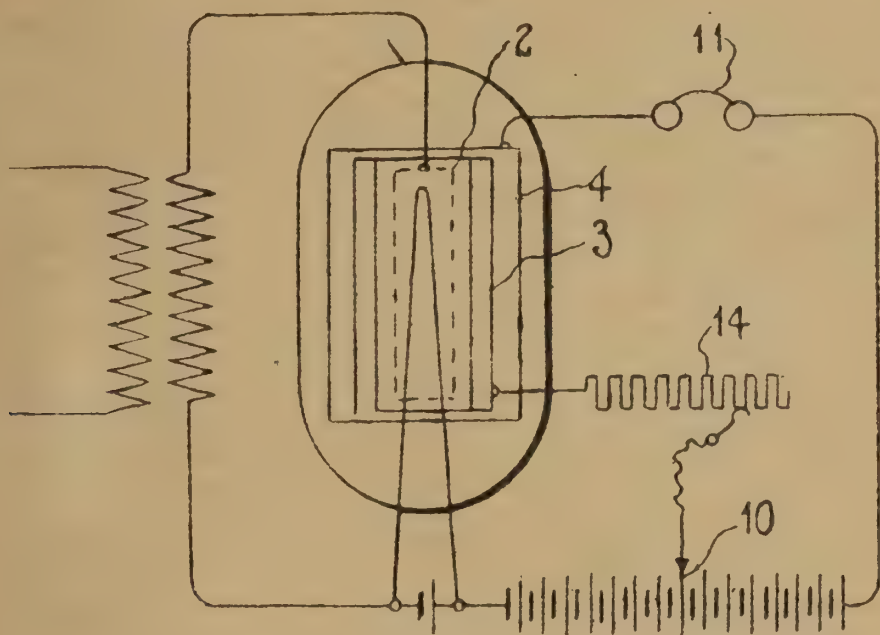


Fig. 7.

The circuit of the slat electrode has a negative resistance characteristic, and in order to make use of this, the arrangement of Fig. 7 may be employed, in which 3 is the slat electrode, 4 the anode, and 14 a positive resistance connected between the point 10 of the battery, which gives a positive potential to the slat electrode, and the slat electrode itself.

The potential resistance may be made to balance the negative resistance of the circuit, as described in Patent No. 15,555/1915, and a high degree of magnification can thus be obtained.

British No. **191,390**. By BRITISH THOMSON-HOUSTON CO., LTD. (Assignees of W. R. G. Baker.)

This patent relates to improvements in a valve generator circuit wherein the oscillations are produced independently of any coupling between the plate and grid circuits by reason of the "dynatron" action of the valve, due to the emission of secondary electrons from the anode, which is maintained at a high positive potential.

It has been found that this dynatron action will take place even when the grid is maintained at a negative potential with respect to the cathode and the generation of oscillations is improved. For this purpose a grid leak and condenser is included in the grid circuit.

To send signals by this method a second condenser is included between the grid circuit and cathode, which can be shunted by an inductance of low resistance when oscillations are to be generated.

On removing the shunt from this condenser the grid of the valve becomes charged to such a high negative value that the oscillations cease.

British No. **193,387**. By TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE, m.b.H.

This patent relates to a valve generator in which the grid is maintained at a negative potential by means of the fall in potential across a resistance connected to the cathode, so that the direct anode current flows through it. The resistance is shunted by a condenser to allow the high frequency current to pass, and a battery may be connected between the grid and the resistance to furnish part of the negative grid potential. The resistance may be varied by speech or by keying for modulating the output current.

British No. **194,279**. By BRITISH THOMSON-HOUSTON CO., LTD. (Assignees of A. W. Hull.)

The first Claim of this patent reads as follows:—

"An electron discharge device comprising a tubular receptacle, having its ends closed by seals, into which are sealed leading-in conductors for supporting the ends of the cathode electrode, the seals being spaced apart to maintain the desired tension in the cathode during construction by means of an arm or arms supporting the grid electrode and secured to the seals."

Three constructions for carrying out the invention are described.

British No. **195,964**. By BRITISH THOMSON-HOUSTON CO., LTD. (Assignees of D. C. Price.)

One of the principal losses incident to the operation of an electron discharge device is that due to the space charge drop between cathode and anode. As is well known this drop may be greatly reduced by the use of a second grid, which is positively charged, interposed between the control grid and anode.

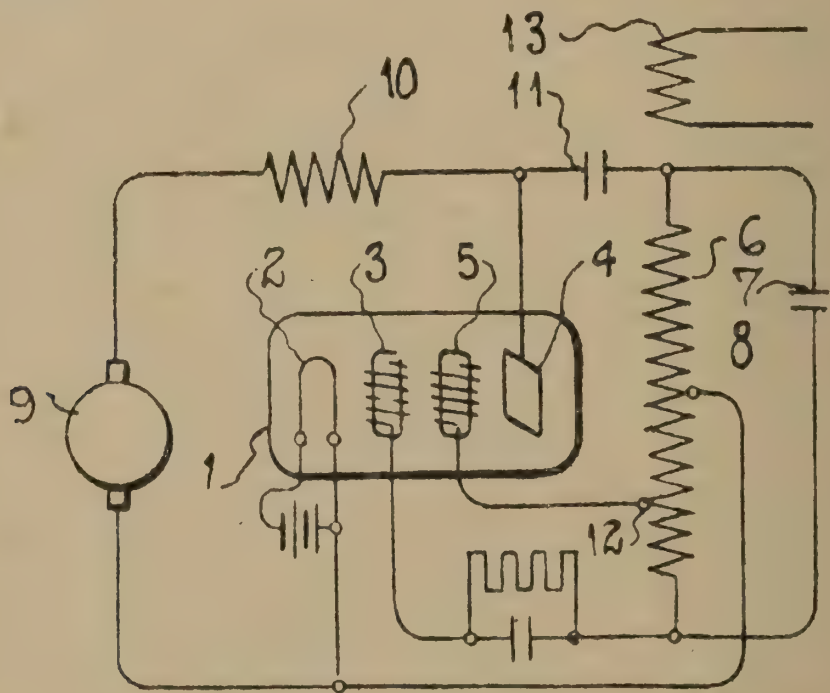


Fig. 8.

The present invention is concerned with a device of this type employed as an oscillation generator. A connection is made from the second grid to the oscillatory circuit in such a manner that the potential of this grid fluctuates in accordance with the potential of the anode, but at a slightly lower value.

As the control grid potential is increased the velocity of the electrons which reach the plate will be increased, and secondary electrons will be emitted. These are prevented from reaching the control grid by means of

the positive potential on the second grid, which thus prevents the loss which would occur if the control grid circuit were to absorb energy from the anode circuit.

Fig. 8 shows a circuit employing the device. The electron discharge device (1) with the control grid (3) and second grid (5), is connected to an oscillatory circuit (6, 7), with the anode (4), control grid (3), connected to opposite ends, and the cathode (2) to an intermediate point (8) on the coil (6). The usual high tension source (9), choke coil (10), and blocking condenser are connected as shown. The second grid (5) is connected to the coil at a point (12), between (8) and the end, to which the control grid is connected, and will then oscillate in potential with grid (3) and anode (4), and the amount of its variation can be so adjusted that it will become just sufficiently positive to permit the maximum current to flow to the plate, but not positive enough to permit it or control grid (3) to receive secondary electrons emitted from the anode. The tendency of the anode to emit secondary electrons may be reduced by providing it with a rough surface or making it of copper or nickel rather than tungsten or molybdenum.

British No. **197,689**. By WESTERN ELECTRIC CO., LTD. (Assignees of A. A. Oswald.)

This patent is for an automatic safety circuit to cut off the high tension supply to an electron discharge device having a water-cooled anode in case the water supply should fail.

Part of the water supply flows through a constricted tube communicating with a U-tube, the lower portion of which is filled with mercury and the upper part with water communicating with that in the supply tube. A float on the mercury is connected with mechanism whereby a contact may be opened on the level of the mercury changing by reason of the variation of pressure at the constriction due to the change of velocity of the cooling water through the system.

The contact controls the no-volt release on the high tension supply circuit breaker.

British No. **199,428**. By J. SCOTT-TAGGART & RADIO COMMUNICATION Co., LTD.

This invention relates to a method for receiving signals wherein the incoming signals have their frequency multiplied, the signals of multiplied frequency are then recombined with the original signals to produce signals of a third frequency, which may be combined with oscillations produced by a local oscillator to enable them to be detected by the heterodyne method.

Thus, if the incoming signals are of a frequency of 100,000 they may be applied to a frequency multiplier or harmonic producer to produce a current of 300,000 cycles. By combining this with the original signals of 100,000, beats of 200,000 cycles may be obtained, and by combining these with a current of, say, 201,000 cycles, the beat note may be rendered audible by a detector circuit and telephone.

The object of this process is to increase the selectivity of the receiver and lessen the effect of atmospherics and damped wave signals.

British No. **201,514**. By WESTERN ELECTRIC Co., LTD. (Assignees of W. G. Houskeeper.)

In order to heat the cathode of high power electron discharge devices large currents are necessary, and the problem of sealing the leading-in conductors which have consequently to be of large diameter, is not easy of solution. The present invention concerns a method of sealing suitable for the above-mentioned conductors.

The leading-in conductor, which is preferably of copper, has a

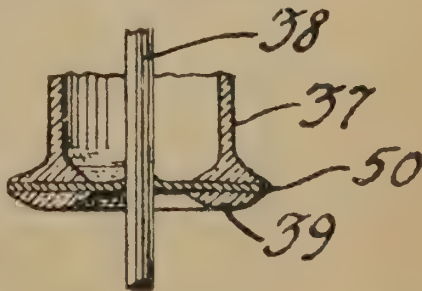


Fig. 9.

thin disc of copper welded to it. The disc may be fused to a flare or flange on a glass tube of the discharge device and an annulus of glass is fused on the other surface of the copper disc. Preferably the rim of the copper disc is exposed and not covered with glass.

The seal is shown in Fig. 9.

British No. **201,585**. By E. GREEN.

The efficiency of a valve used as an oscillation generator is often diminished by losses due to currents which occur in the film of deposit on the interior surface of the bulb. These currents which are caused by the stray electric field between the anode, grid and filament structures, may cause unequal heating of the glass, resulting in local softening and puncturing.

According to the present invention the above difficulties are obviated by providing the valve with a conducting strip or ring placed round one set of electrode supports, and electrically connected to the electrodes, which is supported and sealed at the other end. Alternatively, the anode may be extended in skeleton form so that it surrounds the grid support.

This reduces the electric field due to the electrode structures in the neighbourhood of the container, and thus the currents due to this field are reduced.

Fig. 10 shows the first, and Fig. 11 the second arrangement.

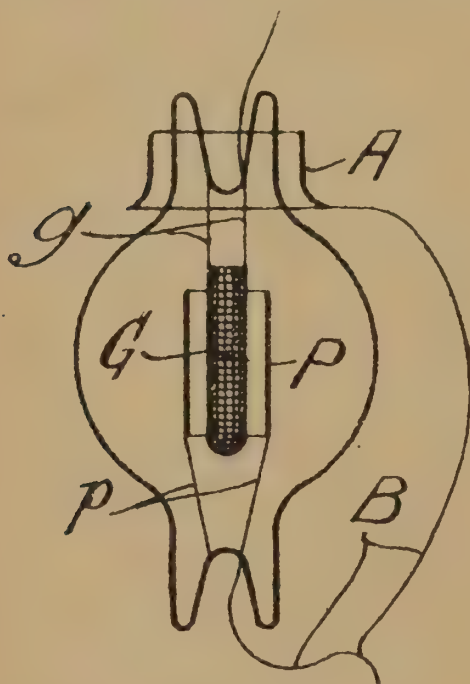


Fig. 10.

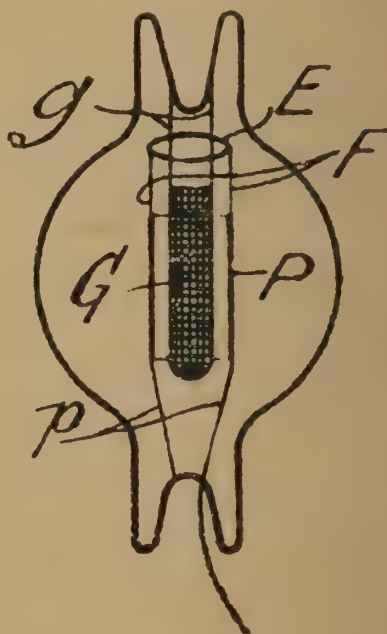


Fig. 11.

British No. **201,591**. By E. Y. ROBINSON.

In order that wireless telephone signals may be received without distortion it is necessary that none of the receiving oscillatory circuits should have a lower decrement than the highest decrement of the modulating wave, otherwise signals of one of the frequencies present in the modulated current will be amplified to a larger extent than those of other signal frequencies. Moreover, in order to demodulate or detect the signals it is essential that the amplitude of the carrier wave in the receiver should be large compared with that of the signals.

The present invention describes a number of circuits whereby the carrier wave may be amplified independently of the signals by means of tuned circuits of low decrement, whilst the signals are amplified by circuits which are more or less aperiodic, and hence do not distort the signals.

By this means the amplification of the carrier wave is greater in proportion than that of the signals. The amplified carrier wave is added to the amplified

signals at the rectifier, which therefore functions under the most suitable conditions.

British No. **202,047**. By WESTERN ELECTRIC CO., LTD. (Communicated by Western Electric Co., Inc.)

This patent protects the Western Electric Co.'s type of valve in which the anode is a metal vessel forming part of the container.

The construction of the valve and its internal fittings is described in considerable detail, but the important feature is the seal between the metal and glass portions.

Claim 1 reads as follows :

"An electric discharge device in which the containing vessel is composed of a metallic portion constituting the anode, and a glass portion, the glass portion being united to a portion of reduced thickness of the metallic anode by fusion or welding."

In the description a preferred form of anode is a copper tube 6 ins. long, 1½ ins. in diameter, and 1/32 in. thick.

The open end is flared out gradually to 2 ins. diameter, and the walls tapered through a length of 1½ ins. to about 0.003 in. at the end. A glass portion about ½ in. long of white lime glass is made with a shape to correspond to the flare of the copper tube, and sealed thereto.

A second glass portion, forming the rest of the container, is then sealed to the first one.

Fig. 12 shows a section of the valve.

British No. **202,262**. By WESTERN ELECTRIC CO., LTD. (Assignees of E. O. Scriven.)

This invention relates to an improvement in the characteristic curve of amplification for a range of frequencies for an intervalve transformer.

It is well known that such transformers when connected in amplifier circuits do not give uniform amplification over the whole range of frequencies that they are usually called upon to deal with. One source of variation, as stated by the specification, is the resonance at certain frequencies in the upper part of the range due to the inter-electrode capacity and the inductance or leakage inductance of the transformer.

The present invention consists in connecting a resistance in shunt to the secondary of the transformer or to a special third winding provided for the purpose.

British No. **202,941**. By NAAMLÖÖZE VENNOOTSCHAP PHILIPS' GLOEILAMPEN-FABRIEKEN.

This invention is for a device for hermetically sealing metal to glass, consisting of a chrome-iron ring or cap-shaped element, having a co-efficient of expansion which is little different from that of the glass, the said metal element being sealed in the glass at its edge.

Whilst it is preferable that the co-efficient of expansion of the metal should equal that of the glass, excellent results have been obtained when the co-efficient for the metal is 10 per cent. greater than that of the glass. Small amounts of impurities in the alloy may occur without decreasing its suitability.

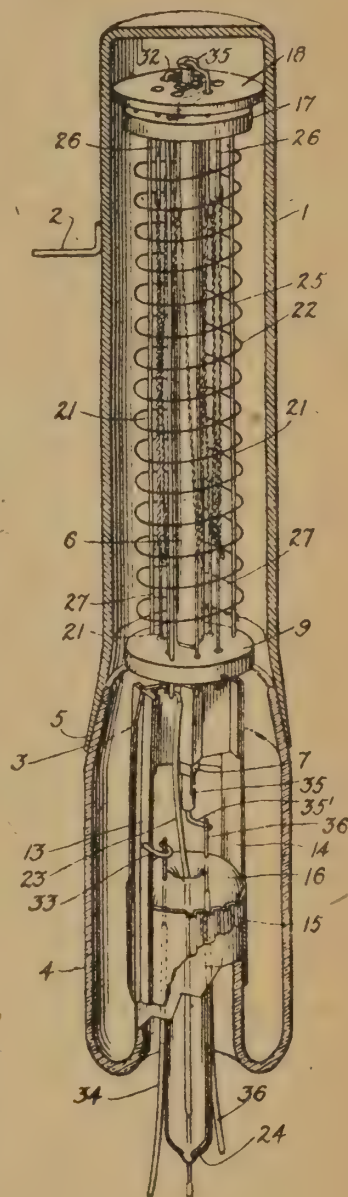


Fig. 12.

British No. **204,053**. By SOCIÉTÉ FRANÇAISE RADIO-ELECTRIQUE.

This is a method, by which the average power delivered to an aerial may be greater during a dot than during a dash, or, alternatively, to increase the power at the beginning of all signals.

In one method described the oscillation generator (*e.g.*, a high frequency alternator) is coupled to the aerial circuit by an inductance and capacity in series.

Contacts are arranged to short-circuit the condenser and simultaneously other contacts short-circuit a coil in the aerial. When these contacts are open the power delivered by the generator to the aerial is greater than when they are closed. Various methods may be employed to close the contacts at the appropriate period. For instance, the relays controlling them may be supplied with rectified current derived from a rectifier coupled to the aerial circuit.

When the aerial is energised the relays will close their contacts after a period depending on the time lag which can of course be adjusted to the correct value.

British No. **204,482**. By E. Y. ROBINSON.

This is a receiving circuit wherein the decrement of the oscillatory circuits (including the aerial, when desired) is decreased when the received signals are increasing in strength, and is increased when the signals are decreasing. The received oscillations are rectified, and the rectified oscillations controls devices such as thermionic valve circuits which alter the decrement.

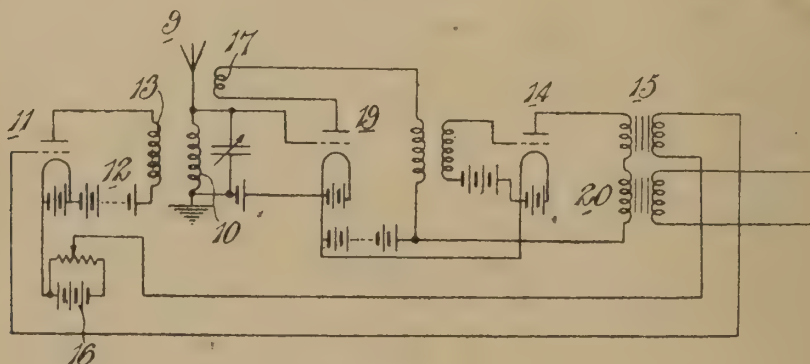


Fig. 13.

Fig. 13 shows one method of carrying out the invention.

The variable decrement is given by the valve (11), coupled by coil (13) to the aerial (10).

The signals are amplified by valve (19), which, being retroactively coupled, reduces the decrement of the aerial. Valve (14) rectifies the signals, and the rectified current is passed through the primary of a transformer (15), the secondary circuit of which is connected to grid of valve (11), which has a biasing potential so that the mean grid potential is on the curved portion of the characteristic. As the signal strength increases, the grid potential becomes more negative, and the resistance of the aerial is reduced, whilst, when the signal strength decreases, the valve applies a large resistance to the aerial.

This method of working has the advantage of giving a high value of signal strength, but causes the signals to cease sooner than if a low decrement be maintained for the whole duration of the signal.

British No. **204,933**. By GENERAL ELECTRIC CO., LTD., and J. W. RYDE.

This relates to an electric discharge device operating with a luminous discharge of the type known as unsupported, *i.e.*, one in which there is no

thermionic or photoelectric emission from the cathode, nor any ionization of the gas by rays from an external source.

The device has an anode, a cathode, and a control electrode. In one arrangement the control electrode has the form of a grid or mesh, and is placed in the dark space separating the cathode from the negative glow.

In another form, the cathode has the form of a grid, and the control electrode which may be a plate, is placed a short distance behind the cathode.

The gas may be of any nature, but for certain purposes the rare gases are preferred. The device may be employed for any of the purposes for which the familiar thermionic valve is used.

British No. **205,206**. By H. ST. J. DE A. DONISTHORPE.

In exhausting the bulb of thermionic valves with electronic bombardment of the electrodes by thermionic emission from the cathode, the glass may be heated, in places excessively, by bombardment of ions formed by collision between the electrons from the filament and the gas liberated from the other electrodes, in places where the electrodes do not protect the glass from the ionic stream.

This invention provides that the above process is carried out with a magnetic field applied to the valve in such a way as to prevent the ions from concentrating on a small area of the glass, but so as to cause them to spread over a large area, and hence prevent local heating.

British No. **205,613**. By E. Y. ROBINSON.

This invention relates to a special form of cathode for a thermionic valve. The cathode is formed of two or more parts separated from one another by a small gap, and it is maintained at the desired temperature by applying a potential difference between them such that a thermionic current flows from the negative to the positive portion. The power dissipated in propagating this thermionic current heats the positive portion to a temperature suitable for causing a thermionic current flow from this cathode to the anode of the valve.

The E.M.F. by which the space current between the two parts of the cathode is produced may be an alternating one, so that both portions become heated equally, or, in suitable designs, a direct current may be used.

It is necessary to heat at least one portion of the cathode by some means to start the thermionic current flowing. This may be done by various means, such as passing a current through or bombarding it by the thermionic current given by an auxiliary cathode placed near it.

British No. **205,837**. By J. SCOTT-TAGGART.

This invention is concerned with a system of reception similar to that described above in 199,428. The scope can be seen from the first claim, which reads as follows:—

“The method of selectively receiving signals which consists in amplifying said signals and then applying them to an electric discharge device for raising the frequency to a multiple of the original frequency for the purpose of increasing the difference in frequency between the desired signal and a signal likely to cause interference, selective tuning arrangements being introduced after the stage of multiplication.”

British No. **205,878**. By L. G. PRESTON, G. SHEARING and G. A. IRVING.

This relates to a method of signalling by the grid potential control method for valve oscillators.

The inductance in the grid/filament circuit consists of two portions, one being connected between the grid and filament, being shunted by a tuning condenser where necessary, and having the usual grid leak and condenser. The remaining portion, with or without extra coils in series, is

shunted by a condenser, and the circuit thus formed is tuned to the oscillatory circuit.

When this is the case the generation of oscillations is stopped. Signalling may therefore be carried on by short-circuiting a part of the inductance or the condenser of the second circuit by a relay or other instrument.

British No. **207,161**. By WESTERN ELECTRIC COMPANY. (Assignees of J. E. Harris).

According to this invention, a step in the evacuation of an electron discharge device having a filament coated with alkaline earth oxides consists in establishing a space discharge between the filament and the other electrodes of the device in an atmosphere of carbon monoxide sufficient to fill the envelope of the device with a blue haze, after which the carbon monoxide is removed and the evacuation of the device completed.

British No. **207,265**. By L. G. PRESTON, G. SHEARING and E. J. GRAINGER.

This relates to improvements in valve circuits for generating oscillations.

The improvements consist in adjusting the series circuit formed by the inductance in the anode circuit (the choke to prevent high frequency oscillations from reaching the power supply) and the condenser between anode

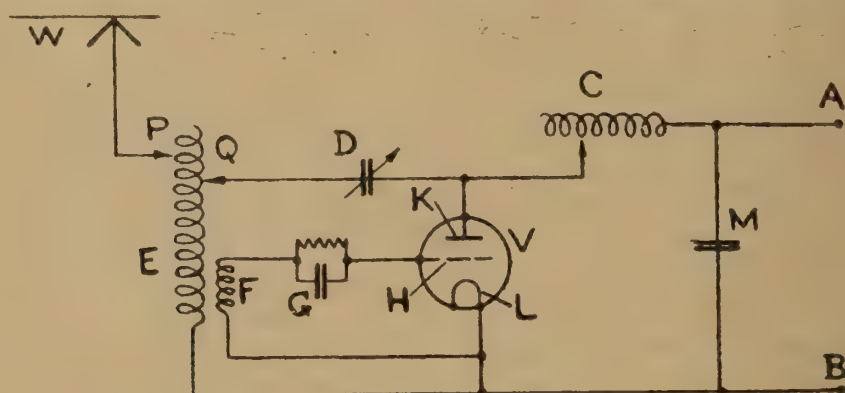


Fig. 14.

and aerial (which prevents the latter short-circuiting the power supply), so that the inductance capacity product is equal, or approximately equal, to that of the aerial or other oscillatory circuit.

In Fig. 14 C is the inductance and D the condenser referred to.

British No. **207,266**. By L. G. PRESTON and N. SHUTTLEWORTH.

This patent concerns a novel method for generating oscillations, and a method for modulating or keying these oscillations based upon the properties of the circuit used.

The circuit is shown in Fig. 15, and Fig. 16 shows the arrangement for keying.

In Fig. 15 the direct current generator H supplying the high tension potential is in series with the oscillatory circuit DE., consisting of inductance L and capacity C, the anode of the valve being connected to a variable tapping point E on the inductance L. The grid is connected to the filament through an inductance Q, the magnitude of which requires accurate determination, and the resistance of which must be extremely low. A battery S shunted by a condenser is connected in the grid circuit to improve the operating efficiency. The inductance Q is not coupled to the circuit LC, but is employed to give a high inductive reactance to the grid-filament circuit with respect to the high frequency current generated. If l be the inductance of Q and c the capacity between grid and filament of the valve, lc is small with respect to the product LC for the oscillatory circuit. For example, lc may be 1 per cent. of LC.

If a resistance be inserted in the grid circuit the magnitude of the oscillatory current in LC is greatly reduced. Since the resistance does not carry a large current, the insertion of a resistance in the grid-filament circuit,

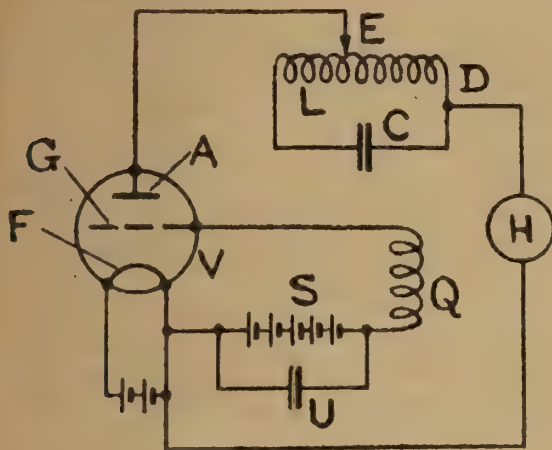


Fig. 15.

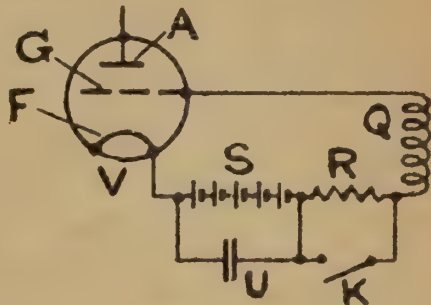


Fig. 16.

as shown in Fig. 16, forms a convenient method for controlling the magnitude of the oscillations generated. A microphone may be used to vary the effective resistance of the circuit, and thus render telephony possible with the arrangement.

British No. **207,514**. By WESTERN ELECTRIC CO., LTD. (Assignees of J. E. Harris).

This invention provides a cathode for power valves comprised of the metal uranium. The uranium is placed in a boat of molybdenum as a fine powder, and the anode is in the form of a plate placed immediately above the thus-formed cathode.

British No. **207,590**. By E. Y. ROBINSON.

This patent concerns a method of sealing two portions of a vacuum device together in a manner whereby they may be separated without destruction of the apparatus. The two parts may be either metallic or non-metallic.

The method consists in giving the portions to be joined a good mechanical fit preferably by grinding them into each other.

The surfaces which are to be in contact are made of a metal which forms an amalgam with mercury, such as copper. They may then be joined by placing them together with a small amount of mercury between to act as a sealing medium.

When one of the portions to be joined is non-metallic it is coated with a suitable metal by electro-deposition. Glass, for instance, may first be coated with a deposit of gold, which is burnt in. Copper is then deposited electrolytically, and then fused to the glass, and finally a sufficient thickness of copper deposited, also electrolytically.

British No. **209,102**. By MARCONI'S WIRELESS TELEGRAPH CO., LTD. (Assignees of R. H. Ranger.)

This relates to a method for the reception of radio signals. In this method two aerials are used having different characteristics with respect to signals, such as different distances from the transmitting station, or different directional characteristics, etc. The signals received on only one of these aerials reach the detector; the signals from the other are used for rendering

the indicating means unresponsive, under certain conditions, and permitting it to respond under other conditions.

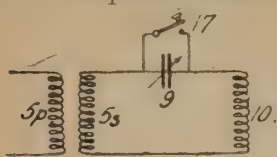


Fig. 17.

The principle underlying the method may be explained by Fig. 17. If the circuits 5s, 9, 10, be tuned to the frequency of oscillations flowing through the coil 5p, then, as is well known, oscillations will appear in the circuit, starting at a small amplitude and building up to a steady amplitude.

If a key (17) be closed to short-circuit the condenser (9) at regular intervals equal to the frequency of the oscillations, and timed so that the potential-difference of the plates of condenser (9) be a maximum, then the energy stored in the condenser will be dissipated, and the circuit will not oscillate.

If, on the contrary, the short-circuiting be timed so that the condenser is discharged, and the energy of the circuit is stored in the inductance, then the circuit will oscillate.

This idea is applied to the reception of signals by the circuit shown in Fig. 18. Signals received by an aerial B are transferred by a circuit 5s, 9, 10, 11, to a valve circuit by which they are detected and passed to an indicator 13.

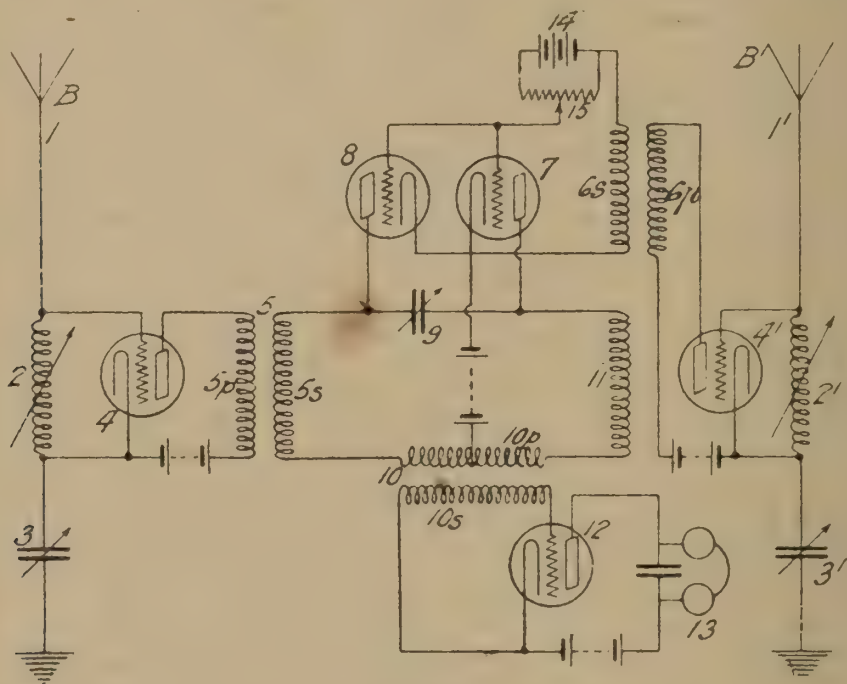


Fig. 18.

The condenser (9) is shunted by two valves (7) and (8), arranged so that by applying a potential to the grids by a coil (6s) the conductivity of the anode/filament circuits may be varied, and thus a variable leak across the condenser is formed thereby. The potential is derived from a second aerial B tuned to the signals to be received, and by suitable means such as phase-shifting devices the potential supplied by the coil (6s) is timed so that the leak due to the valves occurs when the condenser is not charged, so that the energy of the signals from aerial B is not dissipated.

Signals which have different phase differences to those to be received will not build up oscillations in the closed circuit, since the condenser (9) will be short-circuited at some period, during which it is charged either to a maximum or partly. These signals will therefore not affect the indicator (13).

British No. 209,184. By P. W. WILLANS.

In order to produce speech and musical signals in a low frequency valve amplifier, and in other cases also, it is necessary to apply a high negative

voltage to the grids of the valves of the amplifier. The usual method of using a number of dry cells is often inconvenient. The present invention is a circuit by which the separate cells are eliminated. A resistance of suitable value (2,400 ohms in a given case) is connected between the filament and the negative pole of the high tension battery, so that a potential drop is set up by the anode current flowing therein. The grid circuit is connected to a suitable point of this resistance. If more than one valve is used the grid circuits are connected at different points in the resistance to suit the conditions under which each one is working. The resistance is shunted by a condenser of sufficient capacity to pass the alternating current of the signals.

British No. **209,524**. By E. Y. ROBINSON.

In thermionic transmitting valves it is necessary to design the anode so that it may dissipate a large amount of heat. One method is to construct it with metal fins which increase the radiating surface. The present invention describes a modification of this method. In it the anode is made of a spiral strip wound with the turns contiguous. Instead of a flat ribbon, however, the strip is of channel L or T section, etc., so that its surface is largely increased and radiation is promoted.

British No. **209,833**. By E. Y. ROBINSON.

The voltage between two electrodes in a gas necessary to cause a glow discharge between them depends on a number of factors, including the distance between them, and as this distance decreases the voltage necessary for the glow discharge to take place increases provided the actual distance is less than a certain minimum, which depends on the nature of the gas and its pressure.

If, therefore, two electrodes be at a considerable distance apart, the voltage necessary to set up a glow discharge may be made very high by placing a number of conducting screens or shields between them.

The present patent applies this principle to prevent undesirable gaseous discharges from occurring in vacuum devices, such as thermionic valves, mercury arcs, etc., where the vacuum is not perfect; for instance, discharges between the leading-in wires may be prevented.

A number of suitable constructions are described in the specification.

British No. **210,654**. By WESTERN ELECTRIC CO., LTD. (Communicated by Western Electric Co., Inc.)

This relates to a method of coating the filament of a valve with a substance capable of thermionic activity. The method consists in preparing a molten bath of alkaline earth hydroxide (or of a mixture of alkaline earth hydroxide) at a moderate temperature, and dipping the filament for an instant therein.

The object of the invention is to utilise base metals, which may be coated, in place of using platinum or other noble metals as was previously necessary. The procedure adopted prevents the base metal from oxidising when the coating is baked, as in the older method. This oxidization caused the formation of a stable compound with the alkaline earth oxide, which was not adapted to give a large thermionic emission in use.

British No. **211,221**. By E. Y. ROBINSON.

This relates to an electric discharge device adapted to be continually evacuated during operation, and having an envelope formed of two or more separable portions, which are joined by a non-permanent seal. The object of the invention is to provide a construction by which the separable portions may be registered when assembled, so that the electrodes are accurately spaced with respect to one another.

The anode is a cylindrical metal vessel with a central portion of smaller diameter forming the active portion of the electrode, and the other electrodes are carried by a re-entrant tube placed within a vitreous container. The

joint between the anode and the vitreous container is made conical, and the two portions are ground together to fit.

The cathode is carried by a split copper tube fitting the re-entrant tube so that it may be adjusted with respect to the active portion of the anode.

British No. **211,268**. By GENERAL ELECTRIC CO., LTD., and J. W. RYDE.

It is well known that the cathode fall in an unsupported electric discharge is independent of the current passing in the discharge, and is dependent only on the arrangement and material of the electrodes, and on the nature and pressure of the gas, provided the current lies within certain limits.

This effect is utilised to obtain a constant difference of potential or a constant current. An electric discharge tube operating with an unsupported discharge is arranged in series with an adjustable resistance across a source of potential sufficiently high to send a discharge through the tube. By adjusting the series resistance the potential between the electrodes is adjusted so that it lies within the limits for which the cathode fall is normal. This potential will then be constant. The gas in the discharge tube must not be altered by the discharge, and it is hence preferably one of the inactive gases, such as neon or argon.

British No. **211,551**. By E. Y. ROBINSON.

The temperature of the filament of a thermionic valve is not uniform along its length, the ends being considerably cooler than the centre owing to the conduction of heat by the connecting wires.

The thermionic emission from these cool ends will be less per unit length of filament than from the centre, and the effect on the characteristic curve of the valve is to cause the upper bend to be a smooth curve.

The invention consists in surrounding these cool ends of the cathode by tubular shields so that the thermionic emission from them is prevented from reaching the anode. This causes the upper bend of the characteristic to be sharp, which is useful for many purposes. The shields may be insulated or connected to either the cathode or grid, and one construction is given where the shields are formed by extensions of the grid formed as closely wound turns.

British No. **215,105**. By H. J. ROUND and P. W. WILLANS.

This specification describes a valve receiver circuit designed to prevent self-oscillation being set up by means of the reaction, due to the capacity between the anode and grid of the valve. The tuned anode circuit consists either of two condensers in series and the usual inductance, or else of a single condenser and an inductance tapped at the mid-point.

To this mid-point (or else the junction of the two condensers) the filament circuit is connected through the high-tension battery, etc., and a capacity exactly equal to that of the valve electrodes is connected between the opposite end of the circuit to which the anode is connected, and the grid of the valve. This balancing capacity may be an unlit or burnt out valve, which has the advantage that the actual valve capacity is closely matched.

British No. **218,335**. By E. H. ROBINSON, J. SCOTT-TAGGART and RADIO COMMUNICATION CO., LTD.

This specification describes a method for modulating high frequency oscillations by means of a vacuum tube containing neon. The vacuum tube, which has two electrodes, neither of them being heated, is connected in series with the source of modulating potentials across the oscillatory circuit whose output is to be modulated. The modulating potentials vary the conductivity of the neon tube, so that the amount of high frequency oscillations absorbed by it is varied.

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1924

Specifi- cation No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
180,674	27/5/21	14,226/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Frequency changing in receivers.
181,012	1/6/21	15,204/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Wired wireless
182,107	22/6/21	16,243/22	Jouaust, R. A.	Reception of C.W.
183,130	13/7/21	19,170/22	Ges. für Drahtlose Tele- graphie m.b.H.	Reception of C.W.
183,838	27/7/21	20,574/22	B.T.H. Co., Ltd. and C. W. Rice	Method of reducing the effects of interference
184,150	2/8/21	16,286/22	Ges. für Drahtlose Tele- graphie m.b.H.	Frequency changers
184,446	11/8/21	19,496/22	B.T.H. Co., Ltd. and I. Langmuir	Cathodes for valves
184,784	19/8/21	18,583/22	Société Française Radio Electrique	Calling-up device
184,814	22/8/21	22,726/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Wired wireless
185,120	25/8/21	23,015/22	A. Perego	Transmission and reception by same valve
185,397	29/8/21	18,080/22	Y. Marrec	Method of eliminating interference
185,720	9/9/21	17,248/22	L. J. B. Verdier and K. Papoutchian	Method of eliminating interference
185,752	8/9/21	24,275/22	B.T.H. Co., Ltd. and A. W. Hull	Magnetron
186,069	17/9/21	25,051/22	B.T.H. Co., Ltd. and W. R. G. Baker	Modulation with valves
186,070	17/9/21	25,052/22	B.T.H. Co., Ltd. and E. F. W. Alexanderson	Frequency changers with magnetic amplifiers
187,986	28/10/21	29,431/22	B.T.H. Co., Ltd. and E. F. W. Alexanderson	Method of eliminating interference
187,992	29/10/21	29,514/22	Siemens & Halske, A, G,	Valves for measuring purposes
189,112	19/11/21	30,469/22	Ges. für Drahtlose Tele- graphie m.b.H.	Valve amplifiers
189,125	15/11/21	31,118/22	B.T.H. Co., Ltd. & A. W. Hull	Magnetron
189,135	15/11/21	31,252/22	B.T.H. Co., Ltd. & A. W. Hull	Magnetron
190,113	6/12/21	21,830/22	Marconi's W.T. Co., Ltd. & E. Blakeney	Recorder
190,177	12/12/21	33,886/22	G. A. Beauvais	Modulation with valves
190,489	14/12/21	34,176/22	B.T.H. Co., Ltd. & H. I. Becker	Magnetron
190,699	20/12/21	26,005/22	Ges für Drahtlose Tele- graphie	Transmission and reception by the same valve
191,038	28/12/21	350,34/22	B.T.H. Co., Ltd. & A. W. Hull	Valve with two grids
191,390	5/1/22	372/23	B.T.H. Co., Ltd. & W. R. G. Baker	Dynatron
191,723	12/1/22	248/23	B.T.H. Co., Ltd. & E. Austin	Modulation with magnetic ampli- fiers
191,724	12/1/22	457/23	B.T.H. Co., Ltd. & J. B. Pratt	Modulation with magnetic ampli- fiers
192,090	20/1/22	1,943/23	Westinghouse Elec. & Mfg. Co. & J. Slepian	Valves as detectors
192,359	25/1/22	23,772/22	Western Elec. Co., Ltd. & L. Espenschied	Broadcasting system
192,692	2/2/22	2,322/23	J. Bethenod	Wired wireless
192,697	4/2/22	2,762/23	Western Elec. Co., Ltd. & L. Espenschied	Wired wireless
193,010	11/2/22	898/23	C. Lorenz A.-G. & W. Scheppmann	L.F. amplifiers
193,059	10/2/22	4,142/23	E. Pfiffner	Condensers
193,060	11/2/22	4,143/23	E. Pfiffner	Condensers
193,379	14/2/22	30,468/22	Ges. für Drahtlose Tele- graphie & O. von Bronk	Valves with two electrodes as generators

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1924 (*continued*).

Specifi- cation No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
193,387	14/2/22	2,774/23	Ges. für Drahtlose Tele- graphie m.b.H.	Sources of supply of grid potential
193,873	24/2/22	5,597/23	American Radio & Re- search Corp. & H. J. Tyzzer	Inductances
194,279	28/2/22	4,357/23	B.T.H. Co., Ltd. & A. W. Hull	Means for supporting the electrodes of valves
195,088	18/3/22	7,746/23	W. A. Loth	Direction finding
195,589	30/3/22	25,721/22	Western Elec. Co., Ltd. & E. B. Craft	Receiver designs
195,964	8/4/22	9,031/23	B.T.H. Co., Ltd. & D. C. Prince	Valves with two grids
195,982	7/7/24	9,545/23	Wahnoe & Peters ..	Direction finding
195,987	10/4/22	9,695/23	B.T.H. Co., Ltd. & E. F. W. Alexanderson	Valve generating system
195,990	10/4/22	9,805/23	B.T.H. Co., Ltd. & E. F. W. Alexanderson	Earth system
196,273	17/4/22	9,401/23	Marconi's W.T. Co., Ltd. & J. Weinberger	Connecting land lines with radio stations
196,295	13/4/22	10,103/23	Ges. für Drahtlose Tele- graphie	Modulation with valves
196,595	22/4/22	8,990/23	M. Leblanc-Vickers ..	Spark-gaps
196,610	18/4/22	10,551/23	Western Elec. Co., Ltd.	Valves as generators
197,296	2/5/22	5,706/23	D. G. McCaa	Method of eliminating interference
197,689	12/5/22	12,671/23	Western Elec. Co., Ltd. & A. A. Oswald	Operating high power valves
197,911	19/12/22	34,576/22	W. H. Huth	Tuning mechanism
197,958	20/5/22	13,383/23	Société Française Radio Electrique	Paper diaphragms for loud speakers
198,318	23/5/22	22,885/22	W. Dubilier	Method of utilising electrical power mains as aerials
198,355	23/5/22	13,526/23	C. E. Vawter	Condensers
198,359	23/5/22	13,618/23	Western Elec. Co., Ltd. & A. A. Oswald	Means for cooling the anode of a valve
198,362	23/5/22	13,684/23	W. Dubilier	Condensers
198,368	26/5/22	13,859/23	Marconi's W.T. Co., Ltd. A. N. Goldsmith	Secret system of wireless telephony
198,636	2/6/22	20,576/22	Capitol Phonolier Corp.	Receiver Designs.
198,662	30/5/22	13,142/23	G. Seibt	Variable condensers
198,700	5/6/22	14,750/23	B.T.H. Co., Ltd. & W. C. White	Means for supporting the electrodes of valves
199,026	8/6/22	14,934/23	Société Française Radio Electrique	Filters
199,343	13/6/22	23,286/22	C. Brandes, Inc. ..	Telephone receivers
199,349	13/6/22	34,181/22	Picturadio Corp. & E. Keen	Transmission of pictures, etc., by wireless
199,738	23/6/22	16,285/23	C. H. F. Muller	Anodes for valves
199,741	26/6/22	16,475/23	B.T.H. Co., Ltd. & W. E. Story	Photo-electric cells
199,742	26/6/22	16,476/23	B.T.H. Co., Ltd. & E. F. Hennelly	Magnetron
200,476	6/7/22	3,147/23	G. Lakhovsky	Horns for loud speakers
200,490	5/7/22	14,761/23	Soc. des Etablissements Gaumont	Loud speakers
200,823	11/7/22	17,918/23	C. E. Vawter	Grid leaks
201,136	24/7/22	4,952/23	Pacent Electric Co., Inc. & L. G. Pacent	Coil holder
201,138	20/7/22	8,239/23	W. Dubilier	Variable condensers
201,514	29/7/22	33,425/22	Western Elec. Co., Ltd. & W. G. Houskeeper	Valves in metallic vessels; seals for valves
201,560	25/7/22	19,118/23	J. Bethenod and M. Ange	Controlling speed of H.F. alternator
201,564	26/7/22	19,171/23	Western Elec. Co., Ltd., & H. J. Vennes	Wired wireless
201,890	1/8/22	16,615/23	A. B. Cole and P. N. Golden	Variable condensers
201,893	5/8/22	17,788/23	Connecticut Telephone & Electric Co. Inc. & H. P. Doule	Valve with an anode of sodium
201,939	7/8/22	19,983/23	Compagnie pour la Fabri- cation des Compteurs et Materiel d'Usines à Gaz	Valve filaments heated by A.C.
202,262	8/8/22	32,845/22	Western Elec. Co., Ltd., & E. O. Scriven	L.F. intervalve transformer
202,268	8/8/22	3,262/23	M. G. Anderson	Attachment for telephones

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1924 (*continued*).

Specification No.	Date of Application.	No. of Application.	Name of Inventor.	Subject.
202,277	9/8/22	12,994/23	W. Dornig	Frequency changers
202,278	11/8/22	15,226/23	J. H. Hammond, Jr., & E. L. Chaffee	Secret system of wireless telephony
202,294	14/8/22	18,708/23	Western Elec. Co., Ltd.; & F. M. Ryan	Radio broadcasting system
202,300	9/8/22	19,617/23	E. F. Huth	Coated cathodes for valves
202,320	12/8/22	20,469/23	Marconi's W.T. Co., Ltd. & R. H. Ranger	Method of reducing the effects of atmospherics
202,941	22/8/22	29,120/22	N. V. Philips' Gloeilampenfabrieken	Valves in metallic vessels; seals for valves
202,953	24/8/22	6,124/23	Ges. für Drahtlose Telegraphie	Loud speakers
202,978	28/8/22	20,172/23	Funktechnische G.m.b.H. & M. Baumgart	Receiver designs
202,988	24/8/22	21,174/23	L. Levy	Receiver designs: unit system
202,998	24/8/22	21,413/23	Société Française Radio Electrique	Recorders
203,223	24/10/22	28,973/22	W. Dornig	Speed regulators for electric motor
203,284	30/8/22	27,464/22	E. F. Huth, G.m.b.H. ..	Receiver designs
203,293	30/8/22	12,356/23	Ges. für Drahtlose Telegraphie, m.b.H.	Receiver employing an arc with control electrode
203,447	29/6/22	17,921/22	B.T.H. Co., Ltd. ..	H.F. intervalve transformers
203,652	9/9/22	9,690/23	R. C. Browne	Telephone receivers
203,660	6/9/22	17,325/23	Western Elec. Co., Ltd. & E. B. Craft	Variable condensers
203,677	8/9/22	21,727/23	Western Elec. Co., Ltd. & J. P. Maxfield	Loud-speaking public address system
203,678	6/9/22	21,841/23	Marrec, Ltd. & Marrec, Y.	Method of eliminating atmospherics
203,710	9/9/23	22,629/23	Marconi's W.T. Co., Ltd. & Goldsmith, A. N.	Loud speakers
204,010	16/9/22	10,136/23	W. Dubilier	Variable condensers
204,023	13/9/22	19,500/23	B.T.H. Co., Ltd. & C. A. Hoxie	Loud speakers
204,053	13/9/22	22,916/23	Société Française Radio Electrique	Method of keying for transmitters
204,301	19/9/22	11,843/23	D. Grimes	Cascade arrangement of valves for amplification
204,317	22/9/22	22,551/23	Western Elec. Co., Ltd. & W. G. Houskeeper	Method of supporting the electrodes of valves
204,732	8/4/22	10,084/22	Telegraph Condenser Co., Ltd., W. J. Cole & S. G. Brown	Condensers
204,859	4/9/22	23,945/22	Western Elec. Co., Ltd. ..	Microphones
204,910	11/10/22	27,567/22	G.E. Co., Ltd. & C. G. Eden	Method of supporting electrodes of valves
204,933	31/10/22	29,770/22	G.E. Co., Ltd. and R. W. Ryde	Cathodes for valves
205,013	27/2/23	5,741/23	Igranic Elec. Co., Ltd., A. H. Curtis, S. R. Wright & E. J. Brunning	L.F. intervalve transformers
205,038	7/10/22	474/23	F. Peri	Anodes for valves
205,039	7/10/22	767/23	F. Peri	Anodes for valves
205,040	4/10/22	2,571/23	J. Bethenod	Wired wireless
205,102	9/10/22	24,858/23	Société Française Radio Electrique	Regulating the speed of H.F. alternators
205,117	7/4/22	10,002/22	C. Lorenz A.-G. & W. Scheppmann	Inductances
205,148	16/6/22	16,716/22	P. G. A. H. Voigt ..	Means for converting from valve to crystal detector
205,165	7/7/22	18,693/22	A. Couldwell & S. L. Forbes	Insulators
205,190	12/7/22	19,113/22	Westinghouse Elec. & Mfg. Co.	Supplying A.C. to electrodes of valves
205,206	14/7/22	19,411/22	H. St. J. de A. Donisthorpe	Producing high vacua in valves
205,223	19/7/22	19,806/22	A. P. Welch	Filament resistances
205,227	19/7/22	19,842/22	S. L. Forbes	Aerial insulators
205,282	30/8/22	23,492/22	B. Bryan & B.N.B. Wireless, Ltd.	Attachments for telephone receivers
205,296	12/9/22	24,686/22	Betjemann & Sons, Ltd. & H. V. Andrew	Receiver design
205,373	24/11/22	32,123/22	G. H. Champ & G. E. O. Kay	Receiver design
205,389	6/12/22	33,321/22	T. H. Gill	Aerials for aircraft

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1924 (*continued*).

Specifi- cation No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
205,457	12/10/22	475/23	F. Peri	Supporting the electrodes of valves
205,485	13/10/22	24,856/23	Ges. für Drahtlose Tele- graphie	Acceptor or rejector circuits
205,511	7/10/22	25,672/23	F. Peri	Grids for valves
205,512	7/10/22	25,673/23	F. Peri	Supporting the electrodes of valves
205,513	7/10/22	25,674/23	F. Peri	Grids for valves
205,514	7/10/22	25,675/23	F. Peri	Grids for valves
205,613	8/8/22	21,495/22	E. Y. Robinson	Cathodes for valves
205,717	10/11/22	30,806/22	B. G. Calver	Receiver designs
205,744	30/12/12	35,490/22	C. F. Elwell & S. P. Wing	Masts
205,784	21/10/22	11,244/23	N. V. Philips' Gloeilam- penfabrieken	Means for supporting electrodes of valves
205,837	22/4/22	11,397/22	J. Scott-Taggart	Frequency changing in receivers
205,878	25/7/22	20,337/22	L. G. Preston, G. Shearing & G. A. Irving	Valve transmitters
206,074	30/11/22	5,557/23	W. Dornig	Aerials
206,098	11/6/23	15,181/23	A. E. Watkins	Variable grid-leaks
206,107	25/10/22	11,218/23	W. Dubilier	Condensers
206,111	28/10/22	16,583/23	L. de Forest	Gas microphones
206,139	28/10/22	25,852/23	J. Bethenod	Filter circuit for telephones
206,203	27/7/22	20,528/22	Dictograph Products Corp.	Machines for winding coils
206,233	1/8/22	21,032/22	M. J. O'Keeffe & Dick- inson Mfg. Co., Ltd.	Inductances
206,259	10/8/22	21,794/22	A. Orling	Telephone receivers
206,365	9/11/22	30,667/22	G. F. Barrington	Variable condensers
206,499	3/11/22	27,175/23	R. Howe-Gould	Secret system of wireless telephony
206,518	6/11/22	27,902/23	H. d'Amour	Loud speaker
206,601	11/8/22	21,941/22	N. W. McLachlan	Microphones
206,620	30/8/22	23,534/22	S. Strauss	Application of valve amplifiers to telephone lines
206,769	20/2/23	4,982/23	W. Dubilier	Variable condensers
206,805	7/11/22	766/23	F. Peri	Construction of grid for valves
206,837	9/11/22	27,950/23	B.T.H. Co., Ltd. & D. C. Prince	Valve generators
206,838	8/11/22	28,053/23	Ges. für Drahtlose Tele- graphie, m.b.H.	Eliminating interference
206,899	8/8/22	21,601/22	Igranic Elec. Co., Ltd., A. H. Curtis, S. R. Wright & A. H. Mackley	Coil holders
206,910	14/8/22	22,106/22	N. W. McLachlan	Loud speakers
206,912	15/8/22	22,148/22	A. E. Taylor	Filament resistances
206,914	10/5/23	22,155/22	M. J. Mason	Telephone receivers
207,139	16/8/22	27,176/23	T. L. Jones	Supports for telephone receivers
207,161	20/11/22	24,096/23	Western Elec. Co., Ltd. & J. E. Harris	Coated cathodes for valves
207,182	14/11/22	28,728/23	Westinghouse Elec. & Mfg. Co. & P. Thomas	Microphones
207,197	8/11/22	29,032/23	Telefunken Ges. für Draht- lose Telegraphie	Wired wireless
207,234	16/8/22	22,314/22	T. L. Jones	Telephone receivers
207,265	24/8/22	23,023/22	L. G. Preston, /E. J. Grainger & G. Shearing	Valve generators
207,266	24/8/22	23,024/22	L. G. Preston & M. Shut- tleworth	Valve generators
207,292	9/9/22	24,505/22	Radio Communication Co., Ltd., & N. Lea	Wavemeters
207,328	11/10/23	27,490/22	W. C. J. Schlie	Crystal detectors
207,335	14/10/22	27,866/22	H. Saville & C. H. Thorn- ton	Filament rheostat
207,373	21/11/24	31,799/22	A. J. H. Haddon	H.F. transformers
207,391	9/12/22	33,684/22	L. N. Hall	Variable condensers
207,480	18/10/22	18,632/23	A. Orling	Telephone receivers
207,487	21/11/22	150/23	S. M. Franses	Loud speakers
207,514	27/11/22	27,015/23	Western Elec. Co. and J. E. Harris	Cathodes for valves
207,526	21/11/22	29,302/23	B.T.H. Co., Ltd. & C. W. Rice	Method of eliminating interference
207,535	21/11/22	29,414/23	B.T.H. Co., Ltd., & C. W. Rice	Method of eliminating interference
207,537	21/11/22	29,416/23	B.T.H. Co., Ltd. & A. W. Hull	Valves magnetically controlled
207,590	25/8/22	23,097/22	E. Y. Robinson	Seals for valves

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1924 (continued).

Specifi- cation No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
207,627	4/9/22	23,937/22	P. G. Mitchell & H. J. Williams	Masts
207,649	18/9/22	25,208/22	W. J. Brown, H. G. Bell & Metropolitan - Vickers Elec. Co., Ltd.	Condensers
207,720	6/1/23	517/23	W. Diggle	Receiver designs
207,736	22/2/23	5,134/23	R. W. Anstey	Secret system of wireless telephony
207,740	13/4/23	7,071/23	H. C. Phillips	Valves with two filaments
207,746	23/3/23	8,340/23	Western Elec. Co., Ltd. & G. H. Nash	Frame aerials
207,771	8/8/22	28,048/23	Igranic Elec. Co., Ltd., A. H. Curtis, S. R. Wright & A. H. Mackley	Coil holders
207,781	29/11/22	12,995/23	W. Dornig	Frequency changers
207,797	28/11/22	27,953/23	L. A. Hammarlund ..	Variable condensers
207,892	9/9/22	24,504/22	N. Lea, J. Ree & Radio Communication Co., Ltd.	Valve holders
207,898	12/9/22	24,722/22	Sterling Telephone & Elec. Co., Ltd. & M. R. Lawrence	Telephone receivers
208,034	12/1/23	1,153/23	L. F. Barnes	Crystal detectors
208,390	28/12/22	35,249/22	Western Elec. Co., Ltd. ..	Wired wireless
208,414	25/1/23	2,261/23	A. Page	Portable receivers
208,460	23/3/23	8,341/23	G. H. Nash, B. B. Grace & Western Elec. Co., Ltd.	Receiver designs
208,476	8/5/23	12,313/23	J. S. Cattell	Caps for telephone receivers
208,535	18/12/22	31,117/23	Société Belge Radio Electrique	Variable resistance
208,598	21/9/22	25,621/22	F. K. Crowther & Radio Communication Co., Ltd.	Variable condenser
208,667	22/2/23	5,219/23	B.T.H. Co., Ltd.	Insulators
208,735	23/6/22	17,393/22	J. Scott-Taggart & Radio Communication Co., Ltd.	Frequency changers
208,806	30/9/22	26,431/22	R. H. White	Loud speakers
208,809	30/9/22	26,452/22	Igranic Elec. Co., Ltd., A. H. Curtis & S. R. Wright	Inductances
208,848	19/10/22	28,444/22	H. J. Lucas & A. J. Hurst	Duplex system for telephony
208,951	26/2/23	5,523/23	A. C. Sandy & W. Howard	Grid leak
209,037	28/12/22	25,456/23	Marconi's W.T. Co., Ltd., & R. H. Ranger	Method of eliminating atmospherics
209,102	28/12/22	32,437/23	Marconi's W.T. Co., Ltd., & R. H. Ranger	Method of eliminating interference
209,168	3/10/22	26,707/22	M. V. Pirie	Variable condensers
209,173	3/10/22	26,744/22	E. A. Graham	Microphones
209,184	4/10/22	26,842/22	P. W. Willans	Source of supply of grid potential
209,245	16/11/22	31,273/22	B.T.H. Co., Ltd. & J. H. Butcher	Insulators
209,325	24/2/23	5,450/23	Muirhead & Co., Ltd., & H. J. Marshall	Condensers
209,345	29/3/23	8,996/23	Western Elec. Co., Ltd., C. W. Smith & W. L. McPherson	L.F. intervalve transformers
209,415	8/1/23	48/24	Westinghouse Elec. & Mfg. Co. & Freeman, H. M.	Cathodes for valves
209,455	10/7/22	18,919/22	N. P. Hinton	Method of eliminating interference
209,500	12/10/22	27,670/22	E. Hoyle	Valve transmitters
209,505	16/10/22	27,961/22	E. Y. Robinson	Grids for valves
209,524	31/10/22	29,680/22	E. Y. Robinson	Method of cooling anode of a valve
209,563	24/11/22	32,208/22	Edouard Belin & Etablissements Edouard Belin	Transmission of pictures by wireless
209,575	6/12/22	33,22/22	B. N. H. Hamilton ..	Regenerative receiving system
209,576	6/12/22	33,350/22	R. C. Galletti	Spark-gaps
209,683	6/7/23	17,570/23	M. Latour	Frequency changers
209,730	12/1/23	37/24	N. V. Philips' Gloeilampenfabrieken	Cathodes for valves
209,740	9/1/23	647/24	L. Shapiro & Marconi's W.T. Co., Ltd.	Means for supplying current to electrodes of a valve
209,758	11/1/23	855/24	Marconi's W.T. Co., Ltd. & A. N. Goldsmith	Frame aerials
209,761	12/1/23	877/24	Siemens & Halske, A.-G.	Loud speaker
209,775	19/7/22	19,766/22	E. K. Hunter	Valves with two grids and two anodes

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1924 (*continued*).

Specifi- cation No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
209,818	16/10/22	28,100/22	T. W. Case	Photo-electric devices
209,823	17/10/22	28,124/22	I. H. Parsons & A. E. J. Ball	Synchronisation of clocks by wireless
209,833	18/10/22	28,322/22	E. Y. Robinson	Seals for valves
209,834	18/10/22	28,326/22	E. Y. Robinson	Supplying A.C. to valves
209,861	26/10/22	29,209/22	Western Elec. Co., Ltd., & H. Wilson	Valve holders
209,986	10/3/23	6,951/23	A. J. Stevens & Co., Ltd. & H. Stevens	Condensers
210,030	10/3/23	26,904/23	A. J. Stevens & Co., Ltd. & H. Stevens	Condensers
210,142	24/10/22	28,897/22	L. G. Preston, G. Shearing & C. Matthews	Valve transmitters
210,212	20/11/22	31,667/22	A. C. Brown	Telephone receivers
210,238	9/12/22	33,691/22	A. E. Chapman	Grid leaks
210,244	14/12/22	34,182/22	C. W. Clarabut	Loud speakers
210,257	8/1/23	599/23	C. V. Morris	Lighting arrester and leading-in insulator
210,287	31/12/23	2,928/23	Telephon - Fabrik A. - G. vorm J. Berliner	Frame aerials
210,337	4/5/23	12,064/23	P. R. Coursey & Dubilier Condenser Co. (1921), Ltd.	Switches
210,358	2/7/23	17,095/23	G. W. Walton	Telephone receivers
210,405	27/1/23	31,030/23	Société des Etablissements Gaumont	Loud speaker
210,447	27/1/23	2,063/24	A. Sthegens	Variable condensers
210,490	17/7/23	28,423/22	L. B. Miller	Crystal detectors
210,510	30/10/22	29,641/22	B.T.H. Co., Ltd., & R. C. Clinker	Variable inductances
210,549	10/11/22	30,753/22	J. B. Nowlan	Receiver designs
210,577	4/12/22	33,035/22	A. F. Pfeiffer	Variable condensers
210,654	23/3/23	8,342/23	Western Elec. Co., Ltd. ..	Cathodes for valves
210,670	23/4/23	11,026/23	H. A. Gaydon	Variable grid leaks
210,771	1/2/23	2,296/24	E. S. Miller	Variable condenser
210,944	29/12/22	35,378/22	J. H. Dickson	Valve holders
210,948	1/1/23	14/23	N. Cox-Walker & T. H. Gill	Direction finding
210,956	10/1/23	880/23	A. F. Sykes	Microphones
211,045	4/5/23	12,046/23	G. Edwards	Crystal detectors
211,183	12/10/22	27,701/22	S. G. Brown	Loud speakers
211,201	13/11/22	30,962/22	N. H. Clough	Aerials for vehicles
211,221	15/11/22	31,214/22	E. Y. Robinson	Means for renewing cathode of a valve
211,319	23/1/23	2,058/23	B.T.H. Co., Ltd., A. P. Young & J. H. Butcher	Crystal detectors
211,324	26/1/23	2,457/23	Dubilier Condenser Co., Ltd., & P. R. Coursey	Anode resistances
211,398	12/6/23	15,335/23	B.T.H. Co., Ltd.	Anodes for valves
211,512	16/2/23	4,194/24	Marconi's W.T. Co., Ltd. & R. H. Ranger	Method of reducing interference
211,513	19/2/23	4,294/24	Marconi's W.T. Co., Ltd. & A. N. Goldsmith	Receiver designs
211,551	17/11/22	31,455/22	E. Y. Robinson	Cathodes for valves : shields for
211,553	17/11/22	31,466/22	H. P. T. Lefroy	Inductances
211,579	23/11/22	32,093/22	A. K. E. Strathdee	Combined rheostat and valve holder
211,630	15/12/22	34,299/22	B.T.H. Co., Ltd., A. P. Young & J. H. Butcher	Telephone receivers
211,722	15/3/23	7,452/23	H. J. Brookes	Telephone receivers
211,903	31/8/22	23,669/22	E. A. Graham	Receiver designs
211,940	28/11/22	32,452/22	G. E. Stubbs, E. S. Brown & F. Warner	Valves with more than one filament
212,067	13/2/23	4,181/23	Accles & Pollock, Ltd., & W. W. Hackett	Masts
212,076	16/2/23	4,613/23	M. Billington	Crystal detectors
212,177	19/6/23	15,933/23	Marrec, Ltd., & Y. Marrec	Method of eliminating interference
212,199	11/10/23	25,367/23	A. Courtcuise	Variable condenser
212,205	15/11/23	28,884/23	B.T.H. Co., Ltd.	Variable condenser
212,348	1/1/23	46/23	N. Cox-Walker & T. H. Gill	Direction finding
212,381	14/2/23	4,345/23	C. Seymour & J. Erskine-Murray	Wavemeter

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1924 (continued).

Specifi- cation No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
212,415	10/3/23	6,992/23	Sterling Telephone & Elec. Co., Ltd. & T. D. Ward- Miller	Crystal detectors
212,463	29/5/23	14,177/23	F. Pascall	Receiver designs
212,563	10/3/23	5,689/24	Telefunken Ges. für Draht- lose Telegraphie	Frequency changing
212,648	14/12/22	34,175/22	B.T.H. Co., Ltd., J. H. Butcher & A. P. Young	Telephone receivers
212,857	14/12/22	455/24	B.T.H. Co., Ltd., J. H. Butcher & A. P. Young	Telephone receivers
213,005	23/12/22	35,050/22	W. H. Eccles	Insulators
213,030	5/1/23	440/23	R. H. Winter	Variable resistances and induct- ances
213,034	8/1/23	637/23	A. P. M. Fleming, S. J. Nightingale, J. W. Buckley, A. O. Rankine & Metropolitan-Vickers Elec. Co., Ltd.	Modulating system
213,036	11/1/23	938/23	D. S. B. Shannon	Receiver designs
213,069	8/2/23	3,750/23	W. H. Hunter	Inductances: variometers
213,083	20/2/23	4,883/23	P. H. Ealden	Horns for loud speakers
213,084	20/2/23	4,962/23	A. H. Hunt	Grid leaks
213,113	21/3/23	8,106/23	W. E. Barber	Valve holders and sockets for valves
213,211	14/12/22	454/24	B.T.H. Co., Ltd., J. H. Butcher & A. P. Young	Loud speakers
213,309	27/11/22	32,426/22	R. E. H. Carpenter	Receiver designs
213,347	1/1/23	112/23	J. H. Cook	Aerial
213,383	9/2/23	3,919/23	Beswinnings & R. E. Bes- wick	Valve holders
213,386	13/2/23	4,272/23	I. Kajino	Relays
213,387	16/2/23	4,604/23	A. H. Hunt	Protective device for filament of valves
213,395	22/2/23	5,201/23	Fuller's United Elec. Wks., Ltd. & A. P. Welch	Means for utilising electric mains for supplying current to electrodes of valves
213,455	9/5/23	12,484/23	H. F. Holworthy	Frame aerials
213,461	17/5/23	13,250/23	A. Garbarini	Valve with two filaments
213,562	31/3/23	7,009/24	Western Elec. Co., Ltd. & H. W. Nichols	Modulation with valves
213,605	29/3/23	7,990/24	N. V. Philips' Gloeilam- penfabrieken	Cathodes for valves
213,622	29/9/22	26,368/22	E. A. Graham	Loud speakers
213,675	5/1/23	459/23	N. Ashbridge	Resistances
213,699	13/1/23	1,232/23	P. G. A. H. Voigt	Receiver designs
213,700	15/1/23	1,253/23	W. D. Burnet	L.F. intervalve transformers
213,936	5/4/23	8,773/24	A. E. B. Wakefield	Loud speakers
213,957	5/1/23	480/23	G. Tipping, J. W. Hall & G. Derham	Utilising choke coils as grid leaks
213,978	10/1/23	885/23	Dubilier Condenser Co. (1921), Ltd. & P. R. Coursey	Mounting terminals for condensers
213,992	12/1/23	1,127/23	W. W. Drury & Marconi's W.T. Co., Ltd.	Variable condensers
214,005	23/1/23	2,055/23	J. W. Barber	Crystal receiver
214,036	20/2/23	4,993/23	S. Ruben	Relays
214,089	26/4/23	11,285/23	K. E. Edgeworth	Controlling electric supply for valve transmitters
214,129	25/6/23	16,420/23	L. Benson	Crystal detectors
214,226	12/4/23	7,854/24	Telefunken Ges. für Draht- lose Telegraphie	Method of keying in C.W. trans- mitters
214,250	11/4/23	8,982/24	Music Master Corp. & W. L. Eckhardt	Loud speakers
214,262	11/4/23	9,179/24	N. V. Philips' Gloeilam- penfabrieken	Method of coating the electrodes of valves
214,338	22/1/23	1,930/23	A. H. S. MacCallum	H.F. intervalve transformers
214,363	3/2/23	3,230/23	J. H. Hewitt & Wilkins & Wright, Ltd.	Variable condensers
214,385	20/2/23	4,961/23	A. H. Hunt	Variable inductances
214,409	17/3/23	7,691/23	Burton Delingpole & Co., Ltd. & J. T. Tilley	Crystal detector
214,455	16/4/23	10,315/23	General Elec. Co., Ltd. & C. C. Eden	Method of supporting electrodes of valves

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1924 (*continued*).

Specifi- cation No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
214,568	12/10/22	2,493/24	S. G. Brown	Loud speakers
214,609	18/4/23	8,789/24	Société des Etablissements Gaumont	Diaphragms for microphones
214,651	20/4/23	9,858/24	Société Française Radio Electrique	Method of eliminating interference
214,694	17/1/23	1,565/23	W. A. Brady	Valves with two filaments
214,718	24/1/23	2,209/23	P. L. Wostear & R. H. Billingsley	Loud speakers
214,721	25/1/23	2,313/23	E. Y. Robinson	Valve provided with an auxiliary cathode
214,724	25/1/23	2,345/23	R. K. Spencer	Receiver designs
214,734	27/1/23	2,566/23	W. Dubilier	Variable condensers and resistances
214,751	6/2/23	3,465/23	P. A. McCarry	Switching device for inductances
214,754	6/2/23	3,564/23	H. St. G. Anson	Recorders
214,780	13/11/23	5,440/23	S. H. Varnals	L.F. intervalve transformer.
214,800	20/3/23	7,911/23	G. W. Carpenter & W. L. V. Carlson	Telephones
214,848	17/5/23	13,180/23	Winfield Bros., Ltd. & C. J. C. Winfield	Crystal detectors
214,876	27/6/23	16,675/23	W. McClure	Crystal receiver design
214,888	17/7/23	18,380/23	R. V. Willesford, Snr. & R. V. Willesford, Jnr.	Crystal detector
214,929	27/1/23	31,883/23	W. Dubilier	Variable condensers
215,014	26/4/23	10,369/24	Société Française Radio Electrique	Directional aerials
215,053	25/1/23	2,250/23	H. Ingham	Inductances
215,096	2/2/23	3,206/23	Igranic Elec. Co., Ltd. ..	Filament resistances
215,104	5/2/23	3,416/23	H. J. Round	Eliminating distortion in micro- phones and loud speakers
215,105	5/2/23	3,417/23	H. J. Round & P. W. Willans	Method of preventing re-radiation in receivers
215,121	8/2/23	3,841/23	C. F. Elwell, Ltd. & K. Wilson	Receiver designs
215,129	16/2/23	4,545/23	T. F. Wall	Electrolytic condensers
215,151	14/3/23	7,413/23	E. W. Hynes	Indoor aerials
215,164	29/3/23	8,997/23	Western Elec. Co.	Secret system of wireless telephony
215,170	10/4/23	9,783/23	Burndept, Ltd. & C. F. Phillips	Variable condensers
215,186	25/4/23	11,200/23	A. Preen	L.F. intervalve transformers
215,393	5/5/23	11,100/24	Marconi's W.T. Co., Ltd. & L. Shapiro	Receiver design
215,424	5/2/23	3,307/23	G. A. Daubney & E. D. French	Variable condensers
215,437	7/2/23	3,725/23	J. M. Longe & P. V. Castell-Evans	Renewing filaments of valves
215,455	12/2/23	4,101/23	J. Robinson & W. H. Derriman	Method of supplying power to valves
215,458	12/2/23	4,139/23	W. Dubilier	Aerials
215,504	14/3/23	7,372/23	V. S. Roberts	Inductances
215,617	19/6/23	15,895/23	M. B. Cohen	Safety device for valves
215,798	10/11/22	30,742/22	J. Scott-Taggart & Radio Communication Co., Ltd.	Receiver design
215,799	10/11/22	30,744/22	J. Scott-Taggart & Radio Communication Co., Ltd.	Receiver design
215,897	14/3/23	7,317/23	T. F. Wall	Electrolytic condenser
215,906	22/3/23	8,229/23	A. E. Chapman & L. H. Wadsworth	Variable condensers
215,944	27/4/23	11,370/23	B. R. Simmons	Crystal detectors
216,038	5/10/23	24,861/23	Telephone Mfg. Co., Ltd. & L. F. Barnes	Variable condensers
216,049	8/11/23	28,132/23	Radio Communication Co., Ltd. & Beswick, R. E.	Receiver designs
216,139	14/5/23	11,944/24	A. Soulier	Electrolytic condenser
216,147	19/5/23	12,001/24	B.T.H. Co., Ltd. & W. R. G. Baker	Wired wireless
216,193	20/2/23	4,918/23	M. L. Magneto Syndicate & E. A. Watson	High tension generator
216,225	26/2/23	5,553/23	Western Elec. Co., Ltd. ..	Loud speaking public address system
216,246	10/3/23	6,991/23	Sterling Telephone & Elec. Co., Ltd. & T. D. Ward- Miller	Receiver designs
216,247	12/3/23	7,093/23	J. C. Round	Aerials

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1924 (*continued*).

Specifi- cation No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
216,308	30/4/23	11,588/23	T. H. Kinman	Method of preventing re-radiation in receivers
216,334	23/5/23	13,683/23	W. Dubilier	Condensers
216,578	28/2/23	5,843/23	B.T.H. Co., Ltd. & R. C. Clinker	Frame aerials
216,585	1/3/23	6,023/23	C. Seymour, H. E. Hughes & T. E. Goldup	Anodes for valves
216,589	2/3/23	6,123/23	P. W. Willans	Method of preventing re-radiation in receivers
216,650	18/4/23	10,532/23	S. Sheldon	Telephone receivers
216,651	19/4/23	10,771/23	N. Lea & Radio Communi- cation Co., Ltd.	Switching arrangements for re- ceivers
216,657	25/4/23	11,210/23	P. Richardson	Portable aerial
216,749	22/8/23	21,285/23	C. G. Rope	Portable receiver
216,912	5/2/23	3,380/23	F. J. Empson	Loud speakers
216,926	3/3/23	6,171/23	A. Allen	Connectors for telephones
216,946	7/3/23	6,626/23	Western Elec. Co., Ltd.	Loud speakers
216,981	28/3/23	8,820/23	A. W. Vincent	Aerial
216,996	12/4/23	9,974/23	J. G. Lucas	Switching device for inductances
217,022	17/5/23	13,243/23	R. W. Robins	Leading-in tubes
217,042	6/6/23	14,878/23	Sterling Telephone & Elec. Co., Ltd. & W. M. Hol- beach	Receiver design
217,045	12/6/23	15,257/23	J. D. Dunthorpe & W. J. Rickets	Inductances
217,060	25/6/23	16,403/23	E. Boselli	Aerial system
217,066	5/7/23	17,415/23	H. H. Parkin	Crystal detectors
217,192	8/6/23	11,223/24	Siemens & Halske, A.-G.	Loud speakers
217,196	7/6/23	12,133/24	Société Française Radio Electrique	Frame aerials
217,256	4/1/23	370/23	B.T.H. Co., Ltd. & J. Gray	Cathodes for valves
217,259	11/1/23	940/23	D. S. B. Shannon	Receiver design
217,267	6/2/23	3,558/23	R. P. Richardson, T. N. Cole & G. L. Ward	Inductances
217,270	10/2/23	4,040/23	V. Kulebakin	Method of shielding receiving apparatus from external noises on aircraft
217,273	14/2/23	4,355/23	E. Y. Robinson	Method of producing high vacua in valves
217,276	26/2/23	5,598/23	A. Barberis	Horns for loud speakers, etc.
217,327	15/3/23	7,515/23	E. Y. Robinson	Means for cooling the anode of a valve
217,329	16/3/23	7,610/23	W. Kimpton	Valve with two or more filaments
217,344	21/3/23	8,020/23	B. Bryan	Aerials
217,370	9/4/23	9,616/23	C. E. Raeburn & W. E. Taylor	Variable condensers
217,409	23/5/23	13,671/23	P. G. A. H. Voigt	H.F. and L.F. amplifiers
217,552	13/6/23	3,487/24	Western Elec. Co., Ltd., A. A. Oswald & J. C. Schellung	Valves as generators
217,646	19/3/23	7,839/23	L. A. Levy	Cathodes for valves
217,647	19/3/23	7,860/23	T. W. Lowden	Anodes for valves
217,668	23/3/23	8,366/23	C. Seymour & C. E. Horton	Direction finding
217,752	2/6/23	14,566/23	G. F. Ostins & J. F. Smith	Loud speakers
217,810	24/9/23	23,787/23	Fuller's United Elec. Wks., Ltd. & A. P. Welch	Loud speakers
217,856	3/1/24	140/24	A. Milsted	Frame aerials
217,918	19/2/23	15,021/24	Marconi's W.T. Co., Ltd. & A. N. Goldsmith	Inductances
217,942	20/1/23	1,877/23	E. T. Fisk	Aerial system
217,951	20/2/23	4,981/23	W. Dubilier	Variable condensers and resistances
217,971	2/1/23	134/23	J. Scott-Taggart & Radio Communication Co., Ltd.	Means for preventing self-oscillation in receivers
217,972	20/3/23	7,928/23	Western Elec. Co., Ltd. & B. B. Grace	Valve holders
218,020	3/4/23	9,130/23	C. Seymour & G. W. Harris	Variable resistances
218,031	10/4/23	9,782/23	Johnson & Phillips, Ltd. & W. H. Johns	Loud speakers
218,037	14/4/23	10,208/23	A. MacLennan	Means for utilising electric bell system as an aerial
218,038	16/4/23	10,333/23	B.T.H. Co., Ltd., J. H. Butcher & A. P. Young	Loud speakers

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Specification No.	Date of Application.	No. of Application.	Name of Inventor.	Subject.
218,063	8/5/23	12,319/23	Edison Swan Elec. Co., Ltd. & W. J. Davis	Filament resistances
218,066	9/5/23	12,458/23	E. A. Graham & W. J. Rickets	Low frequency amplifiers
218,105	2/1/23	135/23	J. Scott-Taggart & Radio Communication Co., Ltd.	Coupling of large inductances
218,106	5/7/23	17,416/23	H. H. Parkin	Crystal detectors
218,116	17/7/23	18,425/23	W. R. Bullimore	Valve filled with an inert gas
218,221	22/2/23	2,478/24	S. G. Brown	Loud speakers
218,331	2/1/23	136/23	J. Scott-Taggart & Radio Communication Co., Ltd.	Aerial insulators
218,335	4/1/23	274/23	J. Scott-Taggart, E. H. Robinson & Radio Communication Co., Ltd.	Modulation with neon tubes
218,336	4/1/23	304/23	N. Lea, J. Ree & Radio Communication Co., Ltd.	Means for preventing self-oscillation in receivers employing reaction
218,386	5/4/23	9,314/23	D. W. Rees	H. F. alternators
218,403	13/4/23	10,069/23	W. G. Walter	Aerials
218,425	28/4/23	11,521/23	F. K. Woodroffe & R. N. Dawson	Filament resistances
218,428	4/6/23	11,684/23	H. W. Pearce & J. F. Pollard	Loud speakers
218,430	1/5/23	11,786/23	B.T.H. Co., Ltd.	Filaments of lamps, etc.
218,523	23/8/23	21,318/23	H. A. Yoward	Filament resistances
218,743	11/4/23	9,885/23	B.T.H. Co., Ltd. & A. P. Young	Loud speakers
218,753	13/4/23	10,113/23	Johnson & Phillips, Ltd. & W. H. Johns	Loud speakers
218,784	2/5/23	11,837/23	A. P. Portway	Valve with two or more filaments
218,821	18/6/23	15,765/23	A. B. Johanning	Telephones
218,962	16/4/23	12,524/24	N. Oboukhoff	H.F. alternators
219,053	17/3/23	7,752/23	C. Seymour, H. Morris-Airey, G. Shearing & C. Matthews	Valve transmitters
219,070	13/4/23	10,112/23	Johnson & Phillips, Ltd. & W. H. Johns	Loud speakers
219,088	18/4/23	10,570/23	A. H. S. MacCallum	Crystal receivers
219,095	19/4/23	10,714/23	B.T.H. Co., Ltd. & J. H. Butcher	Loud speakers
219,113	26/4/23	11,292/23	Gramostyles, Ltd., & H. Jenkinson	Crystal detectors
219,135	5/6/23	14,678/23	A. H. Railing, J. Stanley & A. E. Angold	Condensers
219,185	4/8/23	20,000/23	C. H. Woodward	Fittings for aerials
219,234	6/12/23	30,709/23	R. H. Winter	Valve holder
219,361	20/3/23	7,963/23	C. C. Phillips	Variable condensers
219,371	17/4/23	10,427/23	Western Elec. Co., Ltd. & S. B. T. Buer	Portable receivers
219,396	25/4/23	11,208/23	Edison Swan Elec. Co., Ltd., P. Freedman & E. Greetham	Cathodes for valves
219,414	28/4/23	11,522/23	F. K. Woodroffe & R. N. Dawson	Variable inductances and condensers
219,470	2/7/23	17,089/23	H. G. Lauste	Portable receivers
219,731	27/4/23	11,408/23	E. Y. Robinson	Means for cooling the anode of a valve
219,823	17/8/23	20,965/23	G. L. Geisey & F. W. Brown	Anodes and grids for valves
219,826	4/9/23	22,207/23	A. P. Welch	Valve holder
219,836	2/10/23	24,466/23	W. J. Davis	Frame aerials
219,862	26/11/23	29,772/23	W. Dornig	Frequency multipliers
220,029	1/5/23	11,683/23	J. Robinson & G. J. R. Joyce	Direction finding
220,047	4/5/23	12,011/23	F. Akister	Inductances
220,161	2/8/23	19,821/23	Stockall, Marples & Co., Ltd. & J. J. Stockall	Unit system for receiving
220,185	26/9/23	24,008/23	C. J. Owen	Variometer
220,352	18/4/23	10,615/23	E. A. Graham	Cabinets for receivers
220,354	2/5/23	11,881/23	R. Ferguson, R. E. Beswick & Radio Communication Co., Ltd.	Unit system for receiving
220,381	16/5/23	13,151/23	E. A. Graham & W. J. Rickets	L.F. amplifiers

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Specifi- cation No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
220,388	17/5/23	13,248/23	J. Robinson & W. H. Berriman	Valves in which grid and anode are in the form of inductances
220,392	18/5/23	13,380/23	G. M. Wright & L. D. Hill	Directional reception
220,420	28/6/23	16,874/23	A. F. Sykes	Microphones
220,431	14/7/23	18,230/23	Hall Bros.	Coil holder
220,459	10/8/23	20,409/23	R. B. Gill	Indoor aeriels
220,462	17/8/23	20,966/23	G. L. Geisey & F. W. Brown	Anodes and grids for valves
220,473	28/8/23	21,726/23	W. E. Elliott	Crystal detectors
220,486	24/9/23	23,824/23	E. R. Hoyt	Means for utilising A.C. for electrodes of valves
220,488	28/9/23	24,162/23	H. Lloyd, E. B. Homer & A. Dilger	Receiver design
220,498	10/10/23	25,255/23	Edison Swan Elec. Co., Ltd. & T. C. Black	Means for protecting the filament of a valve
220,544	10/1/24	738/24	C. A. Collins	Crystal detectors
220,667	23/2/23	5,353/23	W. Dubilier	Wired wireless
220,674	20/3/23	7,972/23	E. A. Graham	Cabinets for wireless receivers
220,724	25/5/23	13,793/23	O. W. Walker	Valve holder
220,727	25/5/23	13,880/23	E. A. Graham & W. J. Rickets	Low frequency amplification
220,744	6/6/23	14,879/23	Sterling Telephone & Elec. Co., Ltd. & W. M. Holbeach	Fine adjustment for receiving apparatus
220,745	9/6/23	15,128/23	W. J. Brown & Metropolitan-Vickers Elec. Co., Ltd.	Means for preventing self-oscillation in receivers
220,747	12/6/23	15,305/23	E. Y. Robinson	Cathodes for valves
220,765	27/6/23	16,733/23	N. P. Hinton & Metropolitan-Vickers Elec. Co., Ltd.	Means for preventing self-oscillation in receivers
220,770	5/7/23	17,450/23	C. H. Johnson	Loud speakers
220,775	16/7/23	18,275/23	S. Eden-Green	Crystal detectors
220,794	3/8/23	19,916/23	Fuller's United Elec. Wks., Ltd. & A. P. Welch	Loud speakers: condensers for
220,806	18/8/23	20,990/23	Hawkers, Ltd. & E. R. Gardner	Condensers
220,825	19/9/23	23,419/23	W. S. Worthington	Unit system for receivers
220,879	3/1/24	193/24	R. H. Winter	Crystal detectors
220,971	21/3/23	8,122/23	Creed & Co., Ltd. & F. G. Creed	Recorders
220,973	29/3/23	8,914/23	R. V. Rawnsley	Fine adjustment for receiving apparatus
220,990	28/5/23	14,081/23	E. A. Graham	Loud speakers
220,996	30/5/23	14,299/23	W. F. Bubbs	Interrupter or buzzer
221,013	2/6/23	14,561/23	E. A. Ollard, E. Y. Robinson & Metropolitan-Vickers Elec. Co., Ltd.	Valves in a container, partly glass and partly metal
221,027	16/6/23	15,719/23	S. Williamson & A. J. Williamson	Means for protecting filaments of valves from H.T. supply
221,053	23/7/23	18,855/23	C. W. Clarabut	Fine adjustment for receiving apparatus
221,110	30/10/23	27,168/23	G. T. Rowe	Crystal detectors
221,133	18/12/23	31,672/23	S. F. Shortt	Variable grid leak
221,277	6/6/23	14,880/23	Sterling Telephone & Elec. Co., Ltd., F. R. Griffiths & J. R. Beard	Loud speaker
221,282	9/6/23	15,127/23	Metropolitan-Vickers Elec. Co., Ltd. & W. J. Brown	Receiver design
221,283	9/6/23	15,129/23	J. W. Buckley, W. J. Brown & Metropolitan-Vickers Elec. Co., Ltd.	Diaphragm for telephones
221,338	24/8/23	21,474/23	N. Kipping & Western Elec. Co., Ltd.	Cathode-ray oscillographs
221,392	6/12/23	30,705/23	Western Elec. Co., Ltd. & B. B. Grace	Tuning devices for receivers
221,393	7/12/23	30,843/23	J. Bethenod	Rejector circuit for telephone receivers
221,438	25/3/24	7,593/24	Radiofrequenz G.m.b.H.	Variable condenser
221,571	14/6/23	15,549/23	W. E. H. Humphrys	Thermionic valve holder
221,594	28/6/23	16,854/23	N. P. Hinton & Metropolitan-Vickers Elec. Co., Ltd.	Inductances

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221,618	26/7/23	19,180/23	E. A. Brennan	Lead-in tube
221,837	16/4/23	10,345/23	N. Oboukhoff	H.F. alternators
221,850	12/6/23	15,306/23	E. Y. Robinson	Rectifiers
221,851	12/6/23	15,309/23	E. Y. Robinson	Cathodes for valves
221,854	14/6/23	15,509/23	E. Y. Robinson	Cathodes for valves
221,855	14/6/23	15,510/23	E. Y. Robinson	Valves in which the anode completely surrounds the filament
221,856	14/6/23	15,521/23	Graham, E. A.	Telephone diaphragms
221,868	19/6/23	15,893/23	Western Elec. Co., Ltd. & G. H. Nash	Receiver designs
221,888	23/6/23	16,365/23	Burndept, Ltd. & C. F. Phillips	Variable condensers
221,902	4/7/23	17,361/23	Igranic Elec. Co., Ltd., A. H. Curtis, S. R. Wright & A. H. Mackley	Inductances
221,923	2/8/23	19,811/23	W. Clark	Loud speaker
221,932	22/8/23	21,271/23	Vickers, Ltd. & C. P. Ryan	Wireless control systems
221,943	3/9/23	22,153/23	F. W. Cox, C. Arrigoni & J. Arrigoni	Crystal detectors
221,949	12/9/23	22,932/23	B.T.H. Co., Ltd. & A. T. Stace	Telephone receivers
221,951	18/9/23	23,288/23	Cooke & Whitfield Wireless Ltd.	Receiver designs
222,174	13/6/23	15,396/23	A. F. Sykes	Diaphragms for loud speakers, etc.
222,176	19/6/23	15,901/23	E. Y. Robinson	Cathodes for valves
222,180	20/6/23	16,046/23	Radiotive Corpn.	Diaphragms for loud speakers
222,193	23/6/23	16,379/23	H. J. W. Barnes, L. B. Tickle & H. L. Rayner	Telephone receivers
222,196	25/6/23	16,466/23	F. P. Bergmann	Telephone receivers
222,208	27/6/23	16,683/23	H. W. Parker	Telephone receivers
222,210	27/6/23	16,732/23	N. P. Hinton & Metropolitan-Vickers Elec. Co., Ltd.	Method of eliminating interference
222,211	27/6/23	16,737/23	T. L. Eckersley	Filter circuits
222,216	3/4/23	9,137/23	L. D. G. Morrison & R. W. Morrison	Secret wireless systems
222,220	29/6/23	16,954/23	G. Seibt	Diaphragms for loud speakers
222,223	30/6/23	17,009/23	E. Y. Robinson	Valves as generators
222,239	7/7/23	17,625/23	A. Marr	Telephones
222,247	17/7/23	18,424/23	W. R. Bullimore	Means for protecting the filament of a valve
222,275	14/8/23	20,606/23	R. F. Tunmer	Crystal detector
222,285	22/8/23	21,259/23	Vickers Ltd. & C. P. Ryan	Wireless control systems
222,301	11/9/23	22,817/23	W. J. Hillier	Variable condensers
222,331	22/10/23	26,322/23	Western Elec. Co., Ltd. & G. H. Nash	Selective receivers
222,334	27/10/23	26,937/23	W. J. Bowyer	Crystal detectors.
222,348	15/11/23	28,782/23	M. Koopman	Crystal detectors
222,413	28/6/23	10,420/23	A. F. Sykes	Resistance-coupled valve amplifier
222,522	5/4/23	9,410/23	S. L. Price	Crystal detectors
222,531	2/5/23	11,869/23	L. Lumiere	Loud speakers
222,545	19/6/23	15,892/23	C. F. Hurst, M. Cooper & A. H. Triggs	Valve holders
222,547	27/6/23	16,689/23	A. W. Sharman	Broadcasting stations
222,551	29/6/23	16,953/23	G. Seibt	Diaphragms for telephones
222,558	2/7/23	17,092/23	Western Elec. Co., Ltd. ..	Wired wireless
222,561	2/7/23	17,143/23	N. V. Philips' Gloeilampenfabrieken	Grids for valves
222,562	2/7/23	17,144/23	N. Ashbridge	Receiver designs
222,564	2/7/23	17,149/23	E. A. Graham & W. J. Rockets	Wire resistances
222,565	2/7/23	17,150/23	E. A. Graham	Loud speakers
222,595	12/7/23	18,045/23	L. H. Paddle	Method of controlling reaction in receivers
222,678	10/10/23	25,181/23	J. G. Hossack	H.T. battery
222,686	18/10/23	25,987/23	A. H. Colley	Aerial
222,687	20/10/23	26,199/23	L. J. Goldhill & L. P. Linden	Receiver designs
222,712	1/12/23	30,249/23	J. H. Hewitt & Wilkins & Wright, Ltd.	Crystal detectors
222,743	1/2/24	2,655/24	R. C. Bowyer	Crystal detectors

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SOME RECENT WORK AT THE NATIONAL PHYSICAL LABORATORY IN CONNECTION WITH WIRELESS RESEARCH

By R. L. SMITH-ROSE, Ph.D., M.Sc., D.I.C., A.M.I.E.E.

I. SIGNAL INTENSITY MEASUREMENT.

DURING the last few years a considerable amount of research has been conducted from the National Physical Laboratory with a view to acquiring exact knowledge of the fundamental facts appertaining to the propagation of wireless waves around the globe. From one standpoint the problem has been attacked by the development of an accurate scientific instrument for the measurement of the intensity of the field due to a distant radio transmitting station. The principles of the method and the experimental arrangements have been described by J. Hollingworth ⁽¹⁾. The field from the distant station induces an e.m.f. in a frame coil tuned to the frequency of the incoming wave. The resulting signal potential difference across the tuning condenser is then applied to a multi-stage resistance-capacity coupled amplifier, and thence to the input side of a rectifying valve arrangement. The steady current flowing in the anode circuit of this valve is balanced by a local e.m.f. adjusted by means of a potentiometer, and a sensitive galvanometer is included in the circuit. On arrival of the signal requiring to be measured the resulting change in anode current of the rectifying valve is noted on the galvanometer. While still receiving the signal the effective resistance of the frame coil circuit is measured by a substitution method. The receiving coil is then disconnected and the amplifier is calibrated by applying a known radio frequency potential to its input terminals of such value as to produce approximately the same galvanometer deflection as that given by the signal. From the above observations the strength of the electro-magnetic field linking the coil can be calculated for the distant station. Owing to the unsteadiness of the galvanometer deflection the instrument cannot be used with sufficient accuracy on ordinary morse transmission, and it is at present only employed to measure radiation during a prolonged dash. This arrangement permits the aerial current and wavelength to be maintained constant, thus contributing to the overall accuracy of the measurement. For the purposes of making more continuous measurements on ordinary morse code signals, a string galvanometer is fitted to the apparatus, which can be used alternatively with the pointer instrument mentioned above.

Under the auspices of the Radio-Research Board four sets of this apparatus have been set up in various places in Great Britain, and daily observations are made of the intensity of the field from certain transmitting stations which send the special signal arranged by the Union Radio-Scientifique Internationale. It is proposed to continue these observations over a considerable period, and the results are forwarded to the laboratory for collation.

2. DIRECTION FINDING OBSERVATIONS.

Since the component forces in an electromagnetic wave are vectorial quantities, it is necessary to measure the direction as well as the magnitude of the electromagnetic field to obtain its complete definition. It is now well known that a plane vertical closed loop or its equivalent rotating about a vertical axis affords a means of determining the direction of the horizontal component of the magnetic field of an arriving wave, and with this property

such a loop finds considerable application as a direction finder. With the aid of such instruments erected in various parts of the British Isles for the purpose of making daily observations of the apparent directions of various transmitting stations, a large amount of data has been collected by the Radio Research Board, and analysed at the N.P.L. during the last few years. The results of this work have both a practical and a scientific interest, and the magnitude and variety of the observations has resulted in the establishment of many tangible facts which are beyond dispute. As this matter has been discussed by the present writer in both the present and previous issues of this Year Book, space is not available here for further description, but the bibliography may be referred to for the original publications on the subject ⁽²⁾.

3. MEASUREMENT OF RADIO FREQUENCIES.

One of the most important functions of the National Physical Laboratory is the setting up and maintenance of standards, both for working and reference purposes, in wireless as in most other branches of pure and applied science. The use of standards of capacity and inductance is not confined to radio work, and they have been employed for many years in other branches of electrical science. These two units are combined in the ordinary oscillatory circuit, and such an arrangement finds application as a wavemeter in wireless measurements. Since, however, the length of electromagnetic waves depends upon the medium through which they travel the constant and fundamental quantity is the frequency of oscillation of the fields comprising the waves. The standard of frequency now in use at the N.P.L. is a modified form of the original Abraham-Bloch Multivibrator, which has been developed by D. W. Dye ⁽³⁾. The multivibrator is an arrangement of three-electrode valves which produces a discontinuous wave, the frequency of which may be varied within wide limits. The inductive action of current of such wave form on another circuit may be considered as a series of electrical blows at equal intervals of time. If the circuit acted upon is highly resonant, and its frequency is adjusted to be an integral multiple of the frequency of the blows, a large oscillatory current is built up of a frequency which is an exact multiple of the fundamental frequency of the multivibrator. In the Laboratory's apparatus two such multivibrators are employed whose frequencies are respectively 1 and 20 kilocycles per second. The most important feature of the apparatus is the means whereby the frequencies are kept constant. The two multivibrators are maintained in harmonic synchronism with each other by the help of the reinforced twentieth harmonic of the low-frequency multivibrator, which in turn is controlled in frequency by means of an electrically maintained tuning fork of frequency 1 kilocycle per second. This complete system therefore forms a source of electrical impulses of extremely steady and accurately known frequencies, which do not depend upon the constancy of any electrical circuit. The impulses from either multivibrator can operate on a selector circuit, consisting of a standard variable condenser of special design, and a set of six inductance coils of small damping decrement, the frequencies available covering a range of 10 to 1,200 kilocycles per second. A selective amplifier serves to amplify any selected harmonic, and by interference with an external source this latter may be set to exact synchronism with the harmonic. Considerable experimental work has been carried out in establishing the accuracy of the standard frequency employed. First, the radio-frequencies given by the multivibrator have been compared with those obtained by calculation from the inductance and capacity of the resonant selector circuit, the measurements of the inductance and capacity being based upon the N.P.L. standard of mutual inductance which is calculable from its dimensions. Secondly, the frequency of the fork controlling the low-frequency multivibrator has been measured in terms of the second given by the standard clock of the Laboratory.

The wavemeter above described is essentially a fundamental laboratory standard of radio frequency, and as such may be used either directly or indirectly for the calibration of wavemeters or other apparatus, and also for the measurement of the frequency of sustained waves emitted by radio transmitting stations. In addition to these it has already been applied to the regular transmission of calibration waves of constant and known frequency, according to a programme which has been published elsewhere ⁽⁴⁾; this broadcasting of the frequency standards enabling the calibration of wavemeters and other apparatus to be carried out at a distance from the Laboratory.

4. MEASUREMENT OF CURRENT AND VOLTAGE AT RADIO FREQUENCIES.

For precision measurements of radio-frequency currents separate heater thermo-junction mountings are employed of various ranges, which enable the direct measurement of currents up to about 2 amperes to be made. For greater values suitable current transformers are employed in conjunction with the above, having a ratio of from 20 : 1 to 200 : 1, which thus enable currents up to 50 amperes to be measured on a 250 milliamperes heater.

With the aid of such radio-frequency transformers, a simple method of providing accurately known voltages at radio-frequencies has been devised by D. W. Dye ⁽⁵⁾, for use in connection with the calibration of apparatus for the measurement of the strength of received signals and for other purposes requiring such voltages. The method is indicated in Fig. 1. Current from

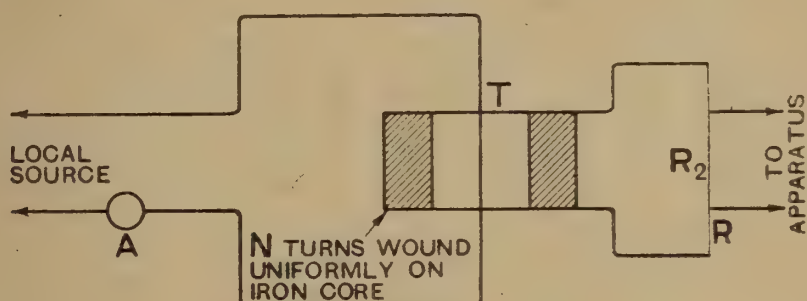


Fig. 1

a local oscillator passes through a high-frequency ammeter A and the primary winding of one or two turns of a radio-frequency transformer T. The secondary of the transformer consists of a uniform winding of not less than 100 turns of stranded wire on a core of thin Stalloy rings. This secondary winding is short-circuited by a moderately low resistance R of fine wire. Potential points at R₂ provide a known potential difference "e" given by the formula $e = \frac{I R_2}{N}$ where I is the primary current in amperes, R₂ is the resistance in ohms between the potential points on the secondary circuit, and N is the ratio of primary turns to secondary turns of the transformer.

The limits of voltage which may be conveniently obtained are approximately 10⁻⁵ to 0.5 volt.

5. INVESTIGATION OF INTERFERENCE PRODUCED BY TRANSMISSIONS.

The degree of interference likely to be caused by any given wireless transmission with other transmissions on neighbouring wavelengths is well known to depend upon the type of waves, *i.e.*, whether damped, undamped,

or modulated undamped; the mode of signalling, whether by interruption or change in wavelength, and also the speed of signalling. An experimental method of determining the "equivalent decrement" of the various types of transmission has been developed (⁶) by measuring the resonance curve for the given transmission with a receiving circuit of constant, and preferably small decrement. The determination of such a resonance curve in the neighbourhood of the transmitting aerial is easily carried out by a direct measurement of the radio-frequency current induced in a suitable receiving circuit. For various reasons, however, it is desirable that the measurements should be carried out at a distance of at least a few wavelengths from the transmitting aerial. The transmission is conveniently received on a small frame coil, with or without a secondary circuit coupled thereto, and the resulting radio-frequency potentials are passed through one or more stages of a valve amplifier, and then on to a rectifying valve measuring circuit. The continuous anode current in this last valve is balanced out by means of a potentiometer arrangement, and the galvanometer then only records the rectified current due to the received signal. After taking sufficient observations to plot a resonance curve for the incoming signals, the decrement of the receiver is determined by plotting a similar resonance curve using a local source of continuous oscillations.

6. INVESTIGATIONS ON AUDIO-FREQUENCY AMPLIFIERS.

In view of the widespread development of modern broadcasting the intervalle coupling used in audio-frequency amplifiers has received much attention in the attempt to minimise distortion in the wireless telephone receiver. A comprehensive investigation of the performance and properties of intervalle transformers has been carried out by D. W. Dye (⁷). From experimental measurements of the effective primary inductance and

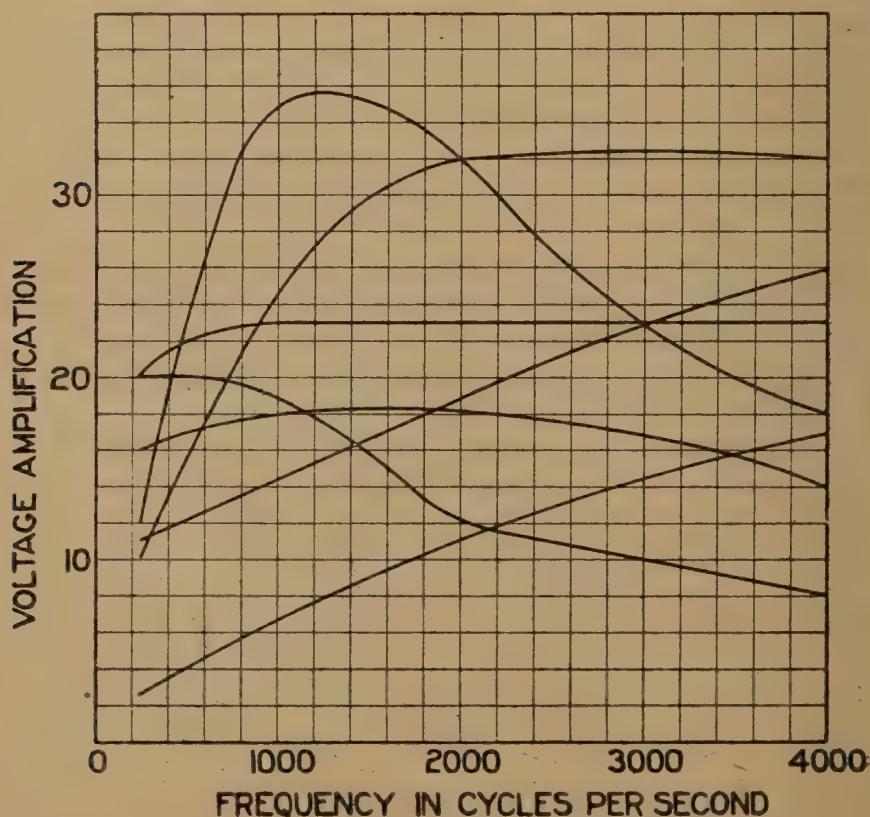


Fig. 2

resistance of transformers it is found that the primary reactance and resistance can be conveniently plotted in the form of a circle diagram. The analysis of the effective components of inductance, capacity and resistance corresponding to this circle diagram demonstrates the effects on primary effective reactance and resistance of mutual and secondary capacity, shunt resistance on the secondary and the attachment of a valve grid-filament circuit. From the measured constants the secondary inductance and self-capacity may be obtained, and the effects of all these quantities on the ratio of the transformer have been examined both theoretically and experimentally. From this complete analysis the amplification factor of the transformer may be calculated, and the results obtained are found to be in close agreement with the values obtained by direct and independent measurement. The standard method of measuring the overall voltage amplification of a stage comprising a valve and transformer has been described previously (⁸), and the variation of this voltage amplification with frequency over the audible range is the important factor determining the amount of distortion liable to be experienced in the use of such a stage for amplification purposes. A selection of amplification-frequency curves for seven transformers typical of those tested at the National Physical Laboratory during the past year, is shown in Fig. 2. In addition to this work, F. M. Colebrook (⁹) has studied the design and behaviour of the resistance-capacity coupling for audio-frequency amplifiers.

7. MISCELLANEOUS AND CONCLUSION.

In the limited space available for this article, brief reference only may be made to other experimental work carried out in connection with wireless research. The electromagnetic screening of various types of apparatus has been investigated in some detail (¹⁰), and a special design of screened local oscillator has been found very satisfactory for use with signal strength-measuring apparatus and direction finders. L. Hartshorn (¹¹) has described a method of accurately determining very small capacities of the order of one micro-microfarad or less, which has a useful application in connection with the inter-electrode capacity of valves and other apparatus. The action of the crystal detector and of the best type of circuit to use therewith has received considerable attention from F. M. Colebrook (¹²), who has shown that with the usual connections, the resistance of the average crystal detector is so low as to throw an effective load into the aerial receiving circuit, sufficient to cause a large reduction in the strength of signals received. This loss can be very largely avoided by connecting the detector in shunt to part only of the aerial tuning inductance: —

It will be gathered from the above that a considerable amount of the recent work of the Laboratory has consisted in the development of methods and apparatus for making the precise measurements, of which wireless, above most other sciences, has been so sadly lacking in the past. The necessity for such measurements is being felt to a rapidly increasing extent by those responsible for the practical development of wireless communication as well as by those who are studying the more academic problems connected therewith. In a later article it is hoped to describe some of the more interesting results which are being obtained in the application of the instruments and technique now available to the study of the more fundamental problems underlying the wireless art.

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BROADCASTING AND LOUD SPEAKERS

By CAPT. H. J. ROUND, M.I.E.E.

CAN we expect to reproduce exactly from a loud speaker the original sounds so as to effectively produce an illusion of the original. It seems to be almost an impossibility owing to the very great complexity of the actions taking place.

Firstly, direct reception from a sound source is accomplished in a binoral way, thus giving a stereoscopic view of the sound, and the brain is usually occupied with what gets to it through the eyes as well as what gets to it through the ears. As an example of this latter effect, I tried the experiment of watching through a sound-proof window, a group of children playing in a garden, and listening to them through the medium of a microphone and quite second-rate loud speaker. It was extremely difficult to persuade myself that I was not listening to them directly, except by switching off, when their voices vanished. On switching on again and drawing down the blinds, one instantly said that the reproduction was not a bit like the original.

Further, to these effects, transmission can, only in ideal circumstances, approach to perfection. The microphone does not exactly reproduce the effect of the human ears. Its constants vary slightly from time to time. Its polar diagram is such that its reception from all angles is not quite the same and certainly not the same as our ears. Faults in the amplifiers, minute in character, occasionally occur and however well designed, amplifiers are not quite perfect.

In the terminal conditions, the possibilities of reflections and resonances in the multitude of parallel connections which have to be made with lines, very often of unknown constants, are such that one wonders sometimes anything is broadcast at all.

With outside broadcast, temporary equipments are never placed in ideal places, lines again of unknown constants lead to the broadcasting station, induction sometimes plays games with one at critical moments, and the chance of a bad contact is ever present.

All broadcasting takes place through a cascade series of valves and it is a physical impossibility to prevent, even under the most ideal circumstances, some introduction of non-linearity into the transmission, and the consequent production of spurious harmonics and combination tones—which in the limit become very evident to the ear as blasting.

I expect that all listeners have noted that the echo background, particularly from outside broadcast, sounds considerably exaggerated, both in telephones and on the loud speaker. Sometimes the effect is exceedingly pleasant and, in some respects, nicer than the original. It will surprise some to know that this effect, in general, lies in the receiving apparatus.

Let us suppose we have a source of sound in which all frequencies are producing equal effect and, for the sake of argument, let us assume that the effect being noted is the amplitude of the alternating component of the air pressure measured say 10 ft. from the sound source. Now we might say that the problem of broadcasting is to convert, by means of the microphone, this pressure variation uniformly into current and back again into pressure applied to the ear by the loud speaker, so that the pressures on all frequencies duplicate the original pressures. Given this reproduction I think it will be agreed that the original sound will be reproduced faithfully, providing phase changes have no serious bearing upon the subject.

Such a source of sound containing all frequencies equally (a spark say) lasts for an extremely short space of time, and the mathematician has a way of considering this impulse as the sum of an infinite number of continuous waves, each very near the next one, which at the instant of the impulse are all at a maximum. All the rest of the waves balance out except at this minute period when the impulse occurs.

Now if, in our process of converting to current from pressure and then back again to pressure, we alter the amplitudes of these continuous waves relative to one another, the original impulse gets converted into one in which there is an imperfect balance at other positions than at the exact moment of the impulse. The impulse develops a musical tail. I will leave out of the discussion what influence phase change will make as this will become very complex.

Now if we produce such a spark in a room, the sound travels to the walls, ceiling and floor, comes back to the observer and, depending upon the room, reverberates several times, and is heard as a succession of impulses with a time interval between each. If this time interval is comparatively short, and the echoes are not separately distinguishable, the ear starts to do harmonic analysis and decides that a musical character has been given to the original sound. We build our audition rooms, concert halls, offices, etc., (or should do) so that in general the strength of musical echo to the original sound is not more than the ear can appreciate. The mathematician applying his analysis will say that in the main the original impulse is not very seriously altered, but it is altered to some extent. There is some musical tail left unbalanced when an impulse is produced in a room. But if we now listen to room echo with a microphone and loud speaker, which is not faithful, the echo will have more tail added by the unfaithfulness, in addition to the original sound being affected, and perhaps in addition we will have to add the tail produced by the room the loud speaker is in. Thus, we find that incorrect transmission or reception will add some echo to that already present, and consequently, as all receiving apparatus in existence at the present time has an unfaithful character, the broadcasting people have to reduce for their normal transmissions from the studio the normal echo of that studio.

The overall result is and must be a compromise, because everybody's telephone or loud speaker is different. Unfortunately this artificial transmission actually retards the introduction of perfect loud speakers because the use of such an instrument receiving from a studio would give extremely dead musical results, the music sounds extremely dead in the studio.

Fortunately, experience has shown one way out of this impasse, and undoubtedly close investigation will completely solve the problem. Certain large halls, such as the Opera House, suit both the unfaithful receiver (which I am of the opinion will remain in majority use) in that the result is pleasant for music and intelligible for speech, and the faithful receiver. The exact reason for this is being closely looked into.

The ideal loud speaker must be constructed in connection with the receiving circuits attached to it so that it nearly re-reproduces in the air the original sound pressure in the broadcast room. It does not follow, however, that sound pressure should be reproduced proportionally as current in the electrical circuits. It is merely necessary that the beginning and end should be correct.

In all loud speakers on the market at present we are a long way from the exact truth, but such is the elasticity of our brain that, providing certain precautions are taken, a great deal of enjoyment can be obtained.

The average loud speaker, the average receiver with a few touches and restrained so as not to run to its limits, is not so bad, but it doesn't like complicated sounds. Smooth musical voices, male in preference to female,

those who get expression without any severe alteration of strength to get it. Piano occasionally, but not too often except as a background. It is so easy to play one's own piano and then get a comparison. Single instruments of the non-impulsive type are good, even if not quite the same timbre as the original. And orchestras should be small and situated in the type of place to give one a sense of listening to something real happening, not to a machine making music.

There are, of course, problems for the broadcasting people, and I must admit they have some extremely difficult problems. I think they should, as a standard, adopt the best moderate priced receivers on the market at any time, as something to work to, for if they can't get good effects on these instruments, then the average man will not. Instruments being developed will not suffer, and as standard instruments improve these can be used as the standard.

Then at our receiving end the rectifiers should be run lightly and without too much reaction. A good note magnifier should be constructed on principles now well known, the two points to watch being correct grid bias on all valves and aperiodic transformers of guaranteed characteristics, or with resistances, or chokes, in place of the transformers. Plenty of high tension should be used, at least on the last valve, and a milliammeter inserted in the various plate circuits. Signals should never be run up to such an intensity that severe kicks of the needle are noticeable.

Loud speakers themselves can be generally classified into two types—horn and hornless. Both types are being rapidly developed.

In general, the horn type make more noise for the same current, but its sound is thrown unnaturally in one direction, unless it is of the vertical type with a reflector to throw the sound equally in all horizontal directions.

Both horn and hornless types should have no pronounced resonance anywhere, and as a rough test of this, the piano scale transmitted from 2 LO should be listened to carefully. Any resonance shows up in two ways; strength, and unnatural prolonging or softening of a note. If a note is unduly strong or cracked, the amplifier milliammeter will usually enable the loud speaker to be freed from blame and the suspicion thrown on the receiver or transmitter.

The transmitter is often at fault with the piano—as stationary waves and slight air pocket resonances have to be carefully guarded against by test and the microphone shifted until no dead notes, cracked notes, or accentuated notes occur. A piano radiates different notes strongest in different directions, and this causes transmission difficulties.

The loud speaker should respond to frequencies up to an octave above the piano; that is, 9,000 cycles per second, but no loud speakers really give this full value, and I doubt whether they occur to full value in all transmissions. At least the piano scale should be fair, up to the top notes. The lower notes are where they all fail, but fortunately nature has provided us with an ear which re-constructs missing tones.

Sharp resonance in a loud speaker is easily recognisable, but there are other defects which one must look for if one wants to produce a good result. The reproduction of the higher notes may be exaggerated, as though the representation was multiplied by some function of the frequency. This is a common fault and is partly corrected by condenser shunts. Again, the middle of the frequency scale may be over represented—this results in a gramophony effect, an exaggeration of echo effects from outside broadcast and a peculiar barking effect with speakers. In certain simple cases this may be corrected by a combination of inductance capacity and resistance. Over production of low tones is seldom met, but may be corrected with inductance shunts.

Harvey Fletcher has shown that the presence of the harmonics only of an instrument can re-construct in the ear the fundamental pitch although, of course, it is obviously better to get the full-valued original.

One can see the enormous difficulties of reproducing the lower tones in an orchestra. We have all probably got the loud speaker up to sufficient strength to reproduce a violin at its original strength, perhaps with some distortion, but how are we practically going to have a loud speaker with large enough diaphragm to reproduce the drum with a diameter of 3 ft. and an initial amplitude of say half an inch? To get anything like that proportion in a normal diaphragm, one must reduce the violin to a very small sound. It is probably not necessary to go to this extreme, as the ear very soon adapts itself to a reduced ratio of deep tone, as in direct listening this ratio is always altering.

The horn type of loud speaker has a habit of cutting off all frequencies below a certain point, and this is a disagreeable feature which is not entirely shared by the hornless type—the cone and pleated diaphragms.

The better types of loud speakers are more susceptible to incorrect transmission, the contrast probably showing it up to some extent—as the greater uniform frequency response enables one to observe errors of transmission or reception in bands of the frequency scale not usually observed, and this to some extent detracts from the improvement given.

The expense of high tension battery at the present time is a serious drawback to good loud speaker work, and unfortunately tends to maintain the more efficient, but worse quality, loud speaker on the market.

The trouble is that a good loud speaker in general is weaker than a bad resonant one. To bring it up to sufficient volume to be satisfying in a moderate room one has the alternative of over-running one's last valve, or spending a small fortune on high tension batteries. A good loud speaker on an over-run set is possibly worse in effect than a bad loud speaker on a set run correctly.

This difficulty will probably tend to vanish as more sets are produced to work off the mains. Small high tension accumulators are only really possible to amateurs as they require careful attention.

The next winter will see a very great interest taken in working from the mains, as it is so wrapped up with the loud speaker problem.

I think it is moderately satisfactory to use the mains for the H.T. of the last valve; there are less troubles, and the current consumption of all previous valves can be kept well down to say an 80-volt battery consuming about 2 milliamperes, whereas the last valve requires 10 milliamperes at 200 volts to be really satisfactory, and this, in dry batteries, is ruinous. The current can easily be supplied from D.C. or A.C. mains at small expense. Working the whole set off the mains will take longer to develop, chiefly owing to the variety of supply and the different local conditions which introduce troubles.

THE ALLOCATION OF WAVELENGTHS TO PREVENT INTERFERENCE.

By ALFRED N. GOLDSMITH, B.Sc., Ph.D.

(Associated Professor of Electrical Engineering, The College of the City of New York ; Chief Broadcast Engineer, Radio Corporation of America.)

AN examination of the wavelength or frequency spectrum of radio emissions at the present time discloses the fact that certain of the allocations are scientific and rational while others are more the result of a perpetuated tradition than of any systematic planning. It also becomes clear that the allocations of wavelength are in a state of flux, particularly at the shorter wave end of the spectrum, and that noticeable alterations may be anticipated within the next few years.

The wavelengths which are available for allocation at this time, in view of the feasibility of generating and radiating considerable amounts of power at such wavelengths for reliable transmission, are from approximately 10 metres (30,000 kilocycles) to 30,000 metres (10 kilocycles). (A kilocycle is 1,000 cycles or, strictly, 1,000 cycles per second). This is a range of 3,000 to 1, or about eleven and a-half octaves. With ordinary or double side-band transmission, each transmitting station requires a width of frequencies or a "frequency band" dependent on the type of intelligence to be transmitted, or, more exactly expressed, dependent on the modulation frequency associated with this type of transmission. For continuous wave telegraphy, the band width for the transmission of the more general outline of the dots and dashes is approximately equal to the number of words transmitted per minute in Continental code. If fairly square and sharp dots and dashes are required, a band three times as wide as this is necessary. For tone telegraphy, a band having a width equal to twice the frequency of the modulating tone is required. For telephony, a band having a width equal to about 20 kilocycles is needed. For true television, a band of width of about 200 kilocycles will be required.

If one side-band is suppressed, or if the still more economical measure of suppressing the carrier and one side-band is adopted, the above specified band widths can be approximately halved, and the transmission facilities are thus utilised twice as effectively, though at the cost of increased complexity of transmitting and receiving apparatus and additional care in the construction and operation of the equipment.

It is thus seen that, neglecting range limitations and the possibilities of directional transmission and reception, the approximate number of simultaneous communications which can be received at any locality using all available wavelengths is as follows for each variety of transmission :

For telegraphy at 100 words per minute..	300,000 messages.
For tone telegraphy, 1,000-cycle note ..	30,000 messages
For telephony	1,500 conversations.
For television	150 pictures

The intelligence-carrying capacity of the ether is thus seen to be large, yet limited—a fact which is sometimes lost sight of by enthusiastic radio "prophets." The actual figure, for the entire world, allowing for duplication of wavelengths of stations at proper separations and for directional transmission and directional reception, is much larger than those given above.

At the present time, transoceanic and long range transcontinental transmissions are carried on with wavelengths above approximately 5,000 metres (60 kilocycles) and, with few exceptions, they are all telegraphic. Overland communication over moderate distances is carried on with wavelengths from approximately 3,000 to 5,000 metres in many instances. The zone lying roughly from 2,000 to 3,000 metres is utilised to a considerable extent for continuous wave ship telegraph communications. From 1,000 to 2,000 metres, certain moderate power broadcasting stations (running even into tens of kilowatts) are carrying on operation or will shortly do so. From 600 to 1,000 metres we find the time-honoured spark telegraph ship transmissions. The wavelengths from 200 to 600 metres have been almost exclusively segregated in many regions of the world for broadcasting transmission in view of the tremendous popular demand for such use. In many countries, the amateurs have been assigned wavelengths in the neighbourhood of 200 metres; for example, in the United States, the wavelengths from 150 to 220 metres are devoted to their use.

Below 150 metres, we reach a region the assignment of which is not definite, and the usefulness of which is under intensive investigation but without complete results up to the present. The larger radio communication companies have been carrying on extensive research work in this domain of wavelengths, and a number of amateurs have also communicated on such wavelengths. It is the general impression of radio engineers conversant with the results obtained that certain distinct if specialised types of usefulness will be worked out for these short waves. They have one obvious advantage, namely, their traffic-carrying capacity. Inasmuch as communication channels are defined in cycles width, as explained above, a great number of simultaneous communications can be handled on the very high frequency ranges corresponding to the short wave zone.

With the single possible exception of the future widespread use of very short waves, radio engineers generally do not look forward to any very marked revisions of the wave bands assigned to various types of service. There will no doubt be some shifts, but presumably very long distance day-and-night communication will still be carried on for some time on the longest waves, intracontinental telegraph and transoceanic telephone communications on the waves just below these, long distance ship communication still further down the scale, and then shorter distance ship communication and broadcasting on the wavelengths say from 2,000 metres down.

When we approach the problem of assigning to a definite station or service the wavelengths or band necessary for its operation, grave difficulties are at once encountered. The governing considerations are not entirely technical, nor are even the technical facts always clearly demonstrable. As a matter of fact, many political issues are involved, either between Governments or between citizens of a single Government.

Consider, for instance, the assignment of a long wave to a transoceanic station. Such stations frequently have a range of many thousands of miles, and, on occasions, to the antipodes. They may cause serious interference with established services and may upset the stability of carefully worked out earlier wavelength arrangements and assignments. Yet there is no power to control the action of a sovereign state in the assignment of wavelengths to its nationals. At best, resort must be had to diplomatic negotiations, generally ending in some sort of compromise or temporary adjustment. At worst, protracted and objectionable interference may result. The difficulty fundamentally is the same as that involved in other economic fields, for example, in the assignment of cable-landing privileges or, for that matter, in the development of foreign oil fields. For some time to come, all solutions will be tentative. The only general principle known to the writer which has been

proposed as a guide in such matters is that of "squatter rights." According to this theory, the establishment of a service on a given wavelength, and its *bona fide* maintenance, give the user the right to hold to this wavelength as against later applicants therefor so long as he is utilising it effectively. There is a rude justice about the idea which is not unlike the principle on which many great empires have been founded. On the other hand, there is nothing scientific about it, and it certainly leaves the assignment of wavelengths to chance and evolution in a way which rather reacts against the complete and logical utilisation of the limited ether facilities.

The assignment of wavelengths to ship stations or other mobile stations in the international service also causes some complications. If, in any particular country, rapid strides in radio development are being made, it is sometimes desirable to alter to some extent the wavelength assignments of the national services of that country. It is easy, under such conditions, to run foul of the mobile station assignments which, being international in nature, are not readily alterable. For example, if ship stations interfere with broadcasting, or *vice versa*, it is extremely unlikely that any one country can arrange matters satisfactorily. Yet the depression of the shipping industry, international jealousies, and other obstacles may prevent speedy modifications of outworn regulations and wavelength allocations. More flexibility in wavelength assignments, even in the international services and the mobile services is required.

The problem of wavelength assignment becomes especially acute in regions where a number of powerful countries of limited area are neighbours. The radio wave knows nothing of national boundaries, which fact is a help to communication and a source of dissension at the same time. There has even been much talk during war time of the "violation of the neutrality of the ether" of the belligerent countries and also of their non-participating neighbours. In great open areas or sparsely populated regions, wavelength allocation becomes a simple matter. Certainly the main problems of wavelength assignment will have to be worked out on the northern shores of the Atlantic and on the Mediterranean. And whatever solutions will bring about order and satisfaction in these regions should, with reasonable adaptation and modification, admirably meet the requirements of less congested regions.

A peculiar new series of problems in wavelength allocation has come about through the rapid spread and partly uncontrolled growth of that remarkable agency of modern civilisation, broadcasting. There are at least two general theories on which the broadcasting service of a country can be developed. One may be termed a resort to individual initiative. According to this plan, those who desire to broadcast are permitted to do so with a minimum of governmental regulation or control. Alterations in their service, changes in wavelength or in method of transmission, and the like are freely permitted. Rapid progress is thus made at the cost of some confusion in the earlier stages of the development. There are also likely to be unnecessarily large numbers of broadcasting stations for which no real justifications exist under such a regime. The other plan might be termed the resort to systematic planning and control. Under such a plan, some large organisation, in command of the broadcasting situation (and, in general, the Government) will lay out as nearly an ideal arrangement of broadcasting stations as it can. Localities, wavelengths, hours of operation, and even programme material will be planned in as great detail as possible. An orderly and smoothly functioning system is thus produced, but progress is somewhat hampered; and radically new discoveries do not fit into such a plan nor do they receive particularly sympathetic encouragement. Much can be said for either system, and it will presumably be on the basis of the temperament and tradition of each people that they will determine the system they prefer.

In countries permitting private interests to broadcast, keen competition for broadcasting privileges may come about between groups desiring to use this agency. One may take as ideal, for example, a moderate number of high power stations in each country, suitably interlinked by wire or radio for simultaneous broadcasting, and possibly with a number of smaller stations of local importance operating as well. The trouble comes when it is attempted to determine the agency to which these privileges shall be assigned. Some will desire to use the ether for advertising reasons pure and simple while others will desire to spread religious teachings or educational material. Amusement programmes will be at the disposal of another group. A list of the groups desiring to broadcast shows astonishing diversity.

Some have held that the radio communication companies are those best fitted to broadcast. Technically this is no doubt the case, yet the selection of programme material and the maintenance of what is in effect a combined, church, theatre, music hall, prize ring, and political forum, is so complex a service to the public that a purely technical organisation might well flinch at the prospect. Presumably governmental broadcasting departments will experience difficulty in meeting so diverse a public demand as would also any specialised entertainment enterprise. A sort of universal genius is required as a broadcast programme director. However, until each country decides what groups are best fitted technically, artistically, and politically to furnish broadcasting service within its boundaries with the greatest satisfaction to its people, the allocation of wavelength privileges in that country will necessarily remain an unsettled question.

ATMOSPHERICS

By T. L. ECKERSLEY, B.A., B.Sc.

ANYONE who has the slightest acquaintance with Wireless may well dispense with a formal introduction to Atmospherics, but in spite of this there are few, if any, who can say with certainty that they know how and where and in what manner they are produced.

A complete determination of the nature of these interesting radio parasites would include the measurement of the form of the X disturbance as well as their frequency, geographical distribution, and seasonal variations.

By X form I mean the actual strength of the electric or magnetic force in the static disturbance considered as a function of the time.

In the past, attention has been almost entirely concentrated on the geographical features and the determination of the wave forms, owing to its inherent difficulty, has only recently been seriously attempted.

In a paper by Appleton and Watson Watt (Proc. of Royal Soc.*), the results of an attempt to determine these forms have been set forth.

The authors use a Western Electric Oscillograph in order to delineate the voltages impressed on an aperiodic type of aerial, and they show that under certain conditions this gives a faithful picture of the variation of the electric forces in the electromagnetic disturbance which constitute "static."

It is not my intention to do more than recapitulate some of the results obtained and to follow out more particularly the implications of these.

Very briefly the characteristic which is most striking is the duration of the disturbances, most of which shown are of a more or less simple type of isolated disturbance averaging about $1/500$ to $1/1,000$ sec. in duration.

The value of this research for radio engineers lies in the fact that by a mere mathematical process the X forms are able to yield results which show the actual as well as relative susceptibility of various types of receiving apparatus to these X disturbances throughout the whole gamut of radio waves.

The process by which these X forms are analysed to give the effects on various wavelengths is akin to a spectrum analysis by the method of Fourier's integral. Any disturbance with a finite number of maxima and minima can be analysed by this method into a series of continuous waves with wavelengths varying from 0 to infinity.

X SPECTRUM.

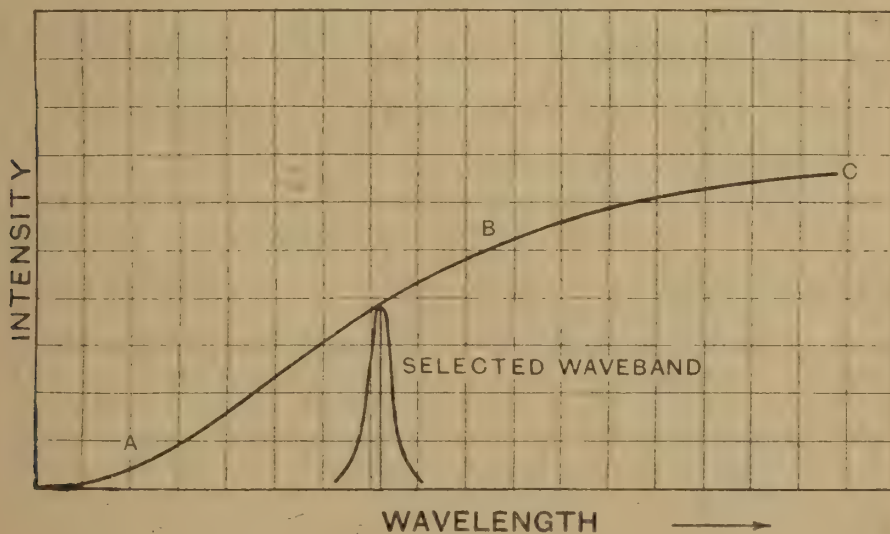


Fig. 1.

If we represent a wavelength along the horizontal axis, and intensity as the ordinate, then any particular X form is represented as a curve A B C

*Proc. Royal Soc. A Vol. 103, 1923, pp. 84.

in this figure which represents the intensity of "spectrum" on all wavelengths.

Any receiver if sharply tuned selects its appropriate band from the spectrum corresponding to the receiving wavelength and has, in consequence, a current induced in proportion to the average intensity of the spectrum in this band, the effective height of the receiving aerial, and finally inversely proportional to the damping constant of the aerial, so that when the latter are the same for all the receivers the curve gives the relative intensity on all waves of the impulses produced by a given X disturbance. If such a process is applied to the X forms given in the paper by Appleton and Watson Watt a serious difficulty at once arises. It becomes at once apparent that these disturbances, snapshotted, so to speak, by the oscillograph are wholly inadequate to produce the results observed. It does not require much physical intuition to see that impulses so prolonged in comparison with the time period of even the longest radio waves can have but little effect on circuits tuned to these waves. It needs a pulse the duration of which is comparable with half the time period of oscillation to produce any marked effect. Such an impulse will produce its full effect during the first half period of swing and there is no cancelling effect on the opposing currents during the next and later swings of the oscillator. But if the impulse is prolonged, the work done by the unidirection impulse on the alternating current in the oscillator is small.

A numerical example will show how small; for instance if we take an impulse of the form $E \frac{a^2}{a^2 + t^2}$ where $a = 1.75 \times 10^{-4}$ sec which approximates

closely to the form shown in Watson Watt's and Appleton's paper (Proc. Royal Soc.) on page 92 of A. Vol. 103, 1923, Fig. 3, we get the following numerical value for the maximum oscillatory current produced in an aerial of 10 m. effective height and 10 ohms resistance on a 15 km. wavelength.

$I = 10^{-71}$ micro amps. If we compare this with the signal produced, by a 50 μ v/m signal (which is a commercial signal strength on this wave), i.e. 50 micro amps., we see that the effect of such an X is absolutely insignificant. The fact is either these prolonged impulses recorded by the oscillograph are not the X's which produce such violent effects on radio waves or they are not sufficiently accurately delineated to show the fine structure which alone produces disturbance in oscillators tuned to waves in the radio range.

It seems to me that the difficulties in the way of getting a faithful record of the faster movement of the spot of light on the oscillograph screen greatly decreases the value for radio engineers of the results obtained by this method.

Without vast improvement it fails to give us the energy spectrum within the radio range.

The theoretically simple and direct method of getting this spectrum is to determine simultaneously the currents impulsed by a given X in a series of aerials tuned to a sufficient number of wavelengths in the range considered.

In practice, of course, this is impossible and the experiment has to be modified so that one aerial successively tuned to a number of wavelengths in the range to be investigated can be made to yield the results required. In this case instead of a single X being the source of disturbance it is the average effect of a relatively large number of X's which is investigated.

The experiment can be performed by noting the strength of signals necessary to read through X's at a given speed, say, on a receiver which can be tuned through the whole gamut of wavelengths. If the decrement of the receiver is the same in all cases the strength of signals necessary to read through X's on any given wavelength will be a measure of the intensity of the X spectrum at this wavelength. A typical X wavelength intensity curve is shown in Fig. 2.

Some curves of similar type are given by Austin in the I.R.E. These follow the same general course as that in Fig. 2. In the curves Fig. 2, the

OBSERVED "X" SPECTRUM (APPROX.)

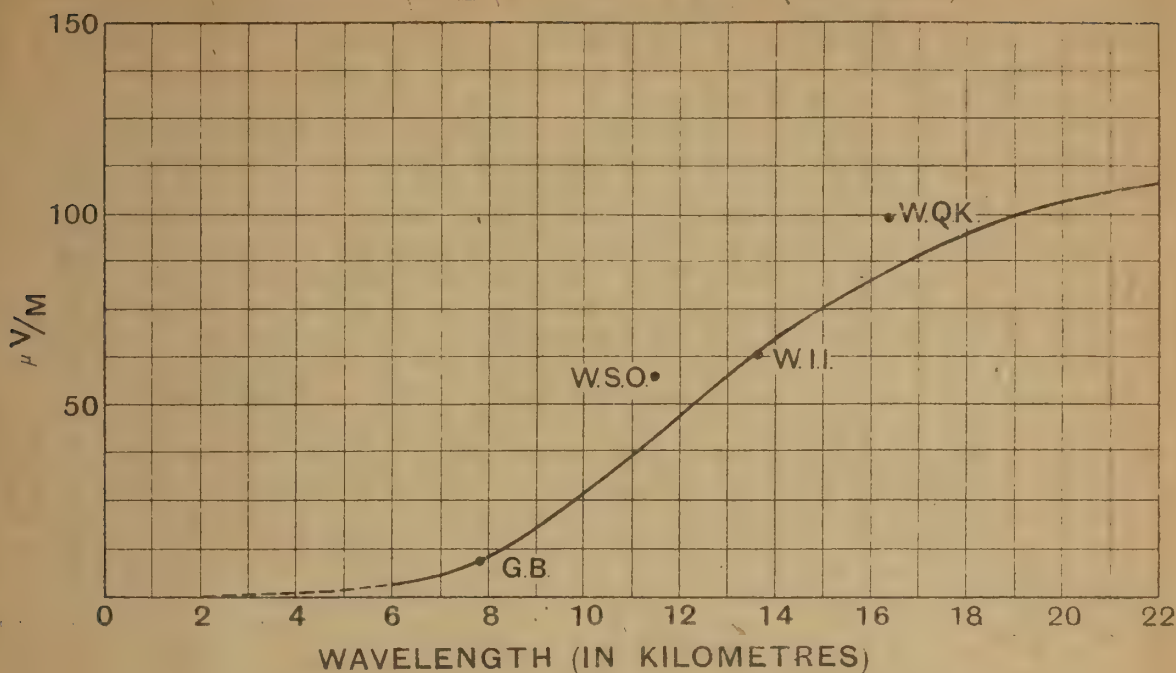


Fig. 2.

GB = Glace Bay.

WSO = Marian, Mass.

WII = New Brunswick, N.J.

WQK = Long Island.

actual signal strength of various commercial stations (received in England) are shown, for the sake of comparison. It will be seen that for instance the "Glace Bay" signals are on a 7,800 m. wavelength and are much weaker than the longer American stations in micro volts per metre, but this weakness is compensated by a corresponding decrease in intensity of the X disturbance so that in respect of the ratio of signal to static all the stations here recorded are more or less the same.

The real gain on the longer waves which chiefly amounts to a greater steadiness of intensity of the signal is not, of course, shown up in this curve, in which averages over a long time have been taken.

These curves are a little difficult to interpret, but they give a measure of the energy spectrum of the average X received in England and America respectively (where the curves were taken). But physiological effects are involved in the readability, which is a function not only of the average intensity of the X's, but of their frequency, so that the curve cannot be considered to be a very precise measure of the quantity we require.

But they supply at least a very necessary piece of physical information to the radio engineer.

A series of such curves taken at any given locality, which for completeness should be taken at every hour of the day and night and should show the seasonal variations, and the relative intensities in all directions will give the radio engineer who is projecting a receiving station for any given service, all the information he requires of the limiting factor of the service, *i.e.*, the X distribution.

The information with respect to X forms is still very incomplete, but considerable progress has been made in finding out the geographical distribution as well as the diurnal and seasonal variations of X's.

This work has been very systematically carried out, with the help of modern direction finding apparatus, by Tremellen while on a expedition round the world, and by Messrs. Beverage and Rust in South America, and by Watson Watt, and many other workers in England.

The exceptionally wide ranges traversed by Tremellen makes his results of special importance in fixing the general features of the world-wide distribution of X's.

Much of the other work becomes intelligible in the light of these results, which will be given in full in a paper before the I.E.E. on May 6th, so they

will be given first. The following charts give a very clear mental picture of the general distribution. The observations were taken during the voyage home from Australia on the S.S. "Boonah" during the months of June, July and August, 1923.

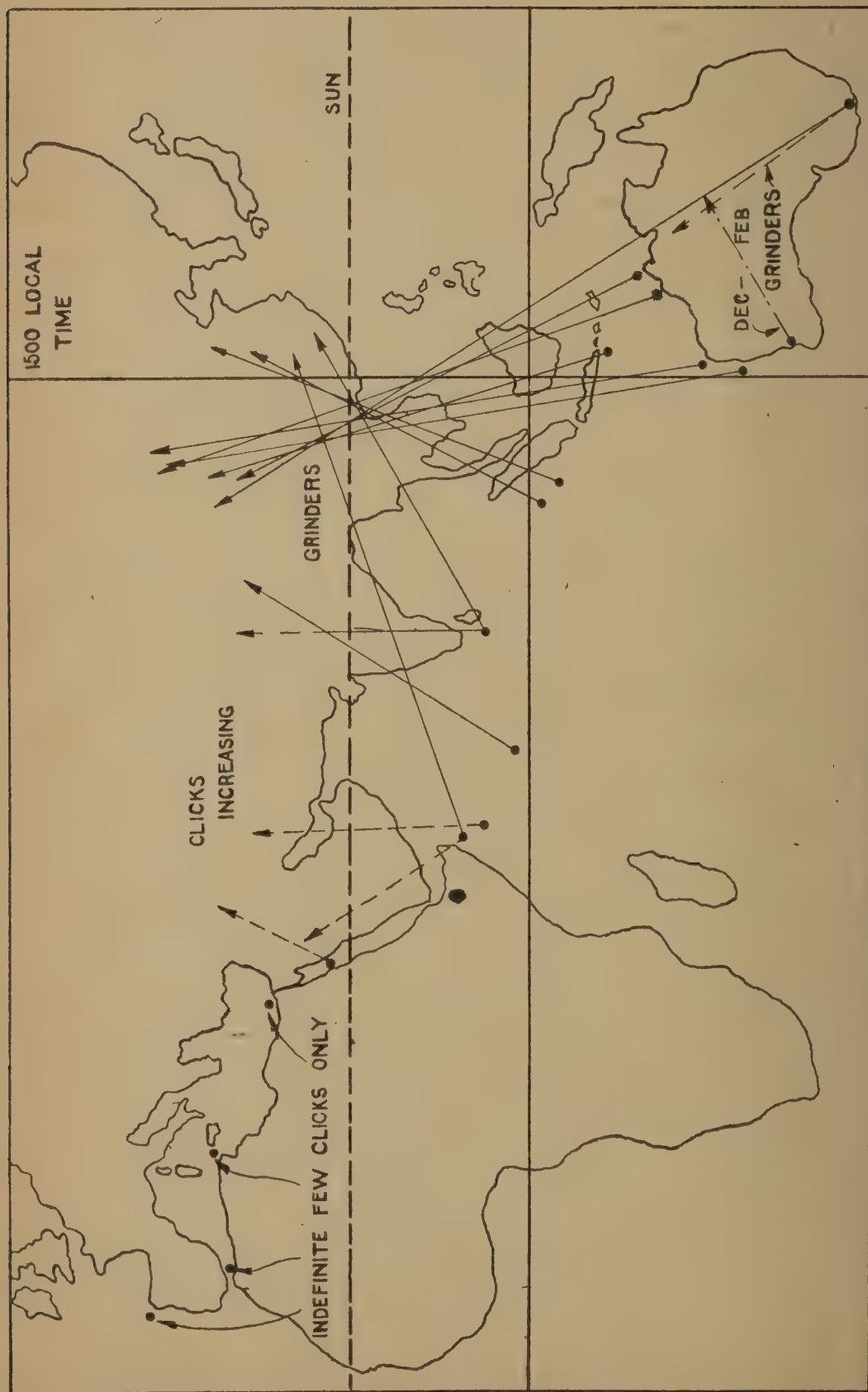


Fig. 3.—Bearings on Atmospherics, S.S. Boonah, 10th June-10th August, 1923. 0700-0800 G.M.T.

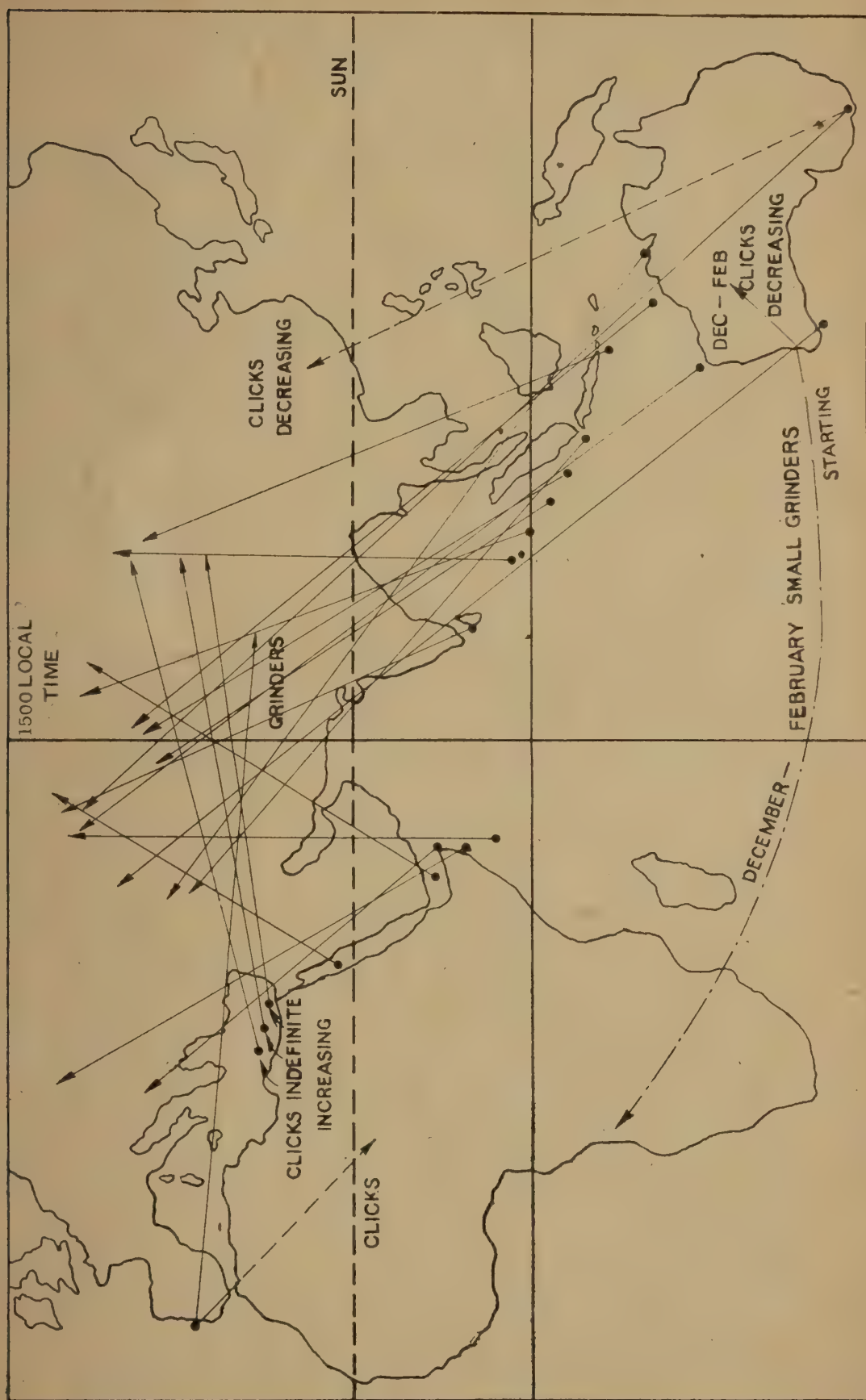


Fig. 4.—Bearings on Atmospherics, S.S. Boonah, 10th June-10th August, 1923. 1000-1100 G.M.T.

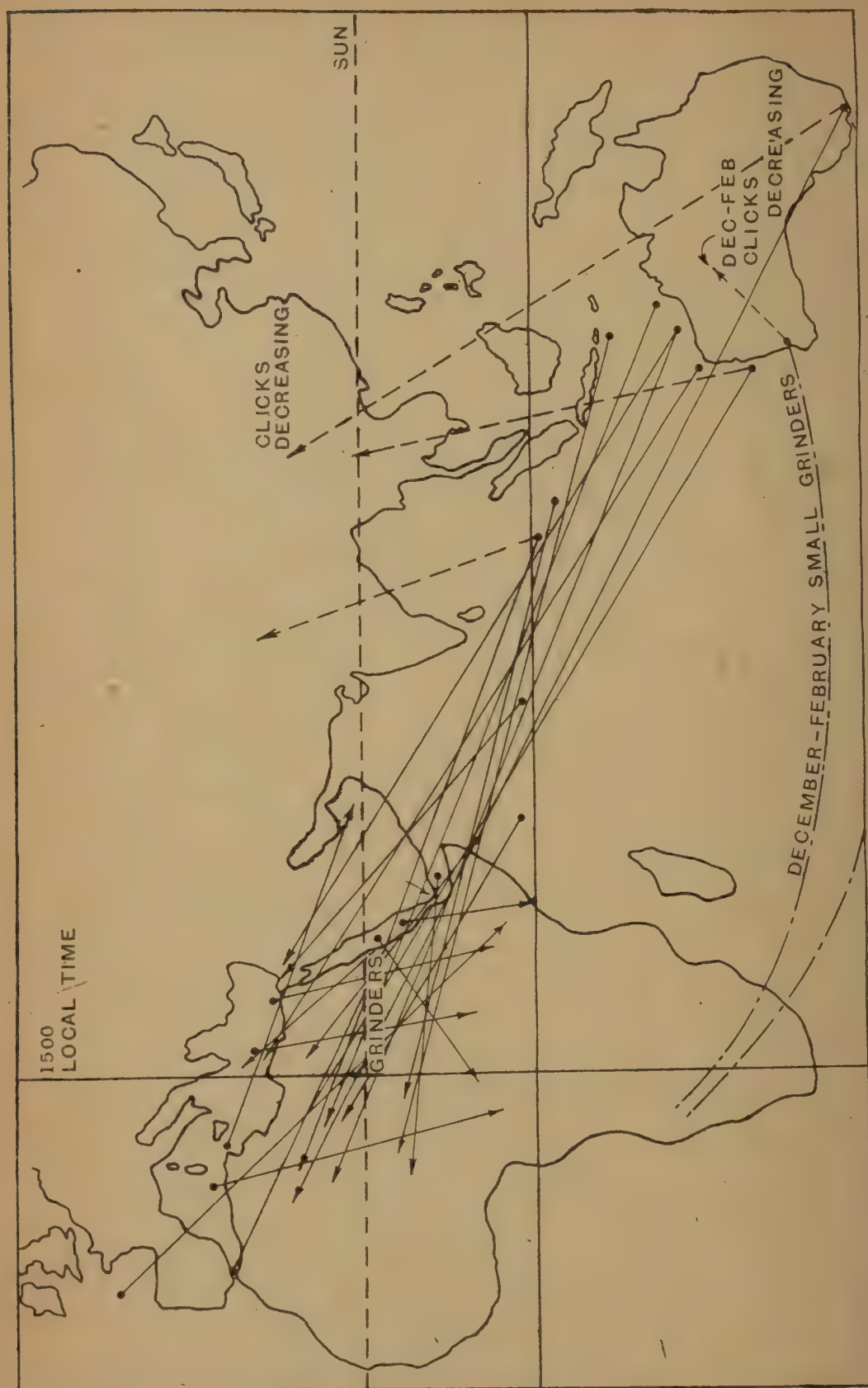


Fig. 5.—Bearings on Atmospherics, S.S. Boonah, 10th June-10th August, 1923. 1300-1400 G.M.T.

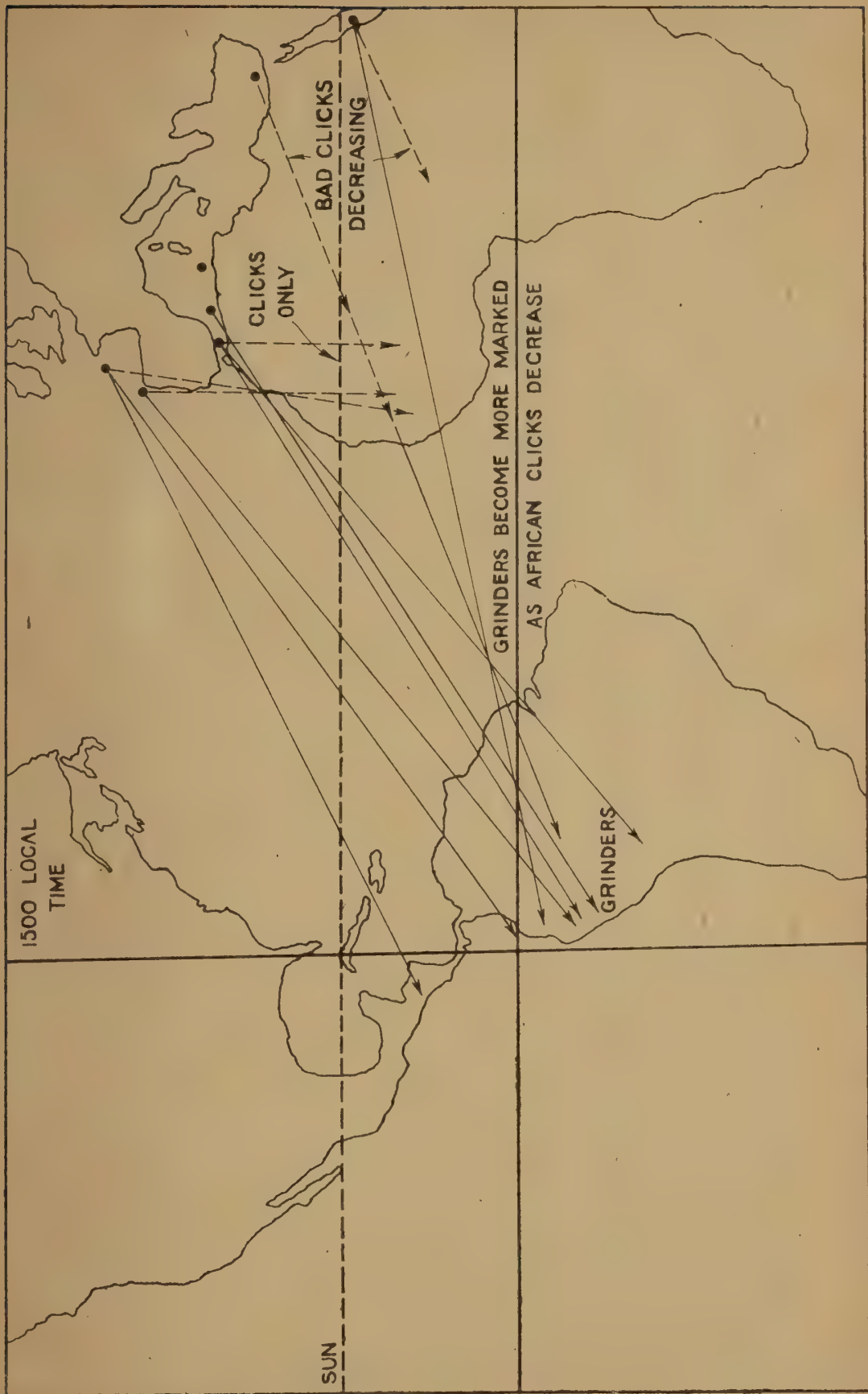


Fig. 6.—Bearings on Atmospherics, S.S. Boonah, 10th June-10th August, 1923. 1900-2200 G.M.T.

The course of the "Boonah" is shown by the dotted lines. The circles on this line represent the various midday positions of the boat. The lines emanating from these points represent the prevalent direction of X's at a given G.M.T., so that if we may consider the "static" to change but little from day to day, these lines should converge at the source or sources of X's if such a well defined source exists at this given G.M.T.

The charts 3, 4, and 5, show a very marked convergence. No. 3 taken at 0700 to 0800 G.M.T. shows a source in Southern China.

No. 4 at 10 to 11 G.M.T. shows another source in the neighbourhood of Afghanistan, and No. 5-13 to 14 G.M.T.—the source has moved on to North Eastern Africa.

It will be seen that the source of X's is in the equatorial regions and moves Westward with the sun and more or less keeps pace with it. That is to say, the maximum frequency and intensity of X's occurs at any place at a definite local time.

The full vertical lines on the chart represent the approximate locus of 3 p.m. local time, and it will be seen that it passes in each case near the centre of the source of X's.

Thus at any place X's will rise to a maximum at 3 p.m., *i.e.*, 3 hours after noon, and then die away again.

Another point of interest which, however, is not so clearly shown on these charts is the fact that there are gaps in the continuity of the X sources, which do not move bodily Westward, but are only present over land areas.

These charts are compiled from material obtained in the summer in the Northern Hemisphere, and it will be seen that the X source is in general North of the equator where the sun is at the highest altitude.

Observations made in Australia show a seasonal change in the prevalent direction of the African X's, which moves from North of the equator in the Northern Summer to South of the equator in the Southern Summer and which therefore follows the maximum altitude of the sun.

The work of Messrs. Beverage and Rust in America can be interpreted in the same way. In particular they obtained an enormous peak of local X's at Rio, and in the neighbourhood of 3 and 4 p.m. local time every day as the following diagram Fig. 7 will show.

The observations of various observers in England of the clockwise drift of the prevalent direction of X's received in England is naturally explained as due to the Westerly drift of the sources of equatorial X's during the day.

These general conditions are often complicated by local conditions and by the distribution of light and shadow on the earth's surface, for on account of the lesser attenuation at night those X's which are produced in the shadowed region will often have more weight than those of equal intensity produced in the daylight which are more attenuated and hence a bias towards the former is often produced.

But if due heed is paid to these matters it is found that in almost every case the observed results indicate that X's are produced with the greatest intensity and frequency over land areas at 3 p.m. local time.

A glance at the thunderstorm charts shows a very marked similarity so that if X's are not actually produced by lightning flashes their production is favoured by conditions which produce thunderstorms. In this connection the results of Watson Watt should be noted. They indicate that the more or less local X's which are observed on 600 m. wave are associated with the forward edge of a depression.

It may be as well to point out at this stage that the results obtained are altered when receiving on a short wavelength. Just as with daytime radio, long wave signals are necessary for long distance communication so with the X's received on a selective aerial relatively distant X's are only obtained when long wave receivers are used and only local X's on short

waves. A short wave directional receiver will therefore only give a picture of relatively local conditions, whereas long wave receivers are necessary if we are to include distant regions as well. K. Tremellen's results were obtained on wavelengths ranging from 12 to 24 km. on which waves the attenuation is more or less unimportant so that distant sources of X's are not unduly reduced in intensity.

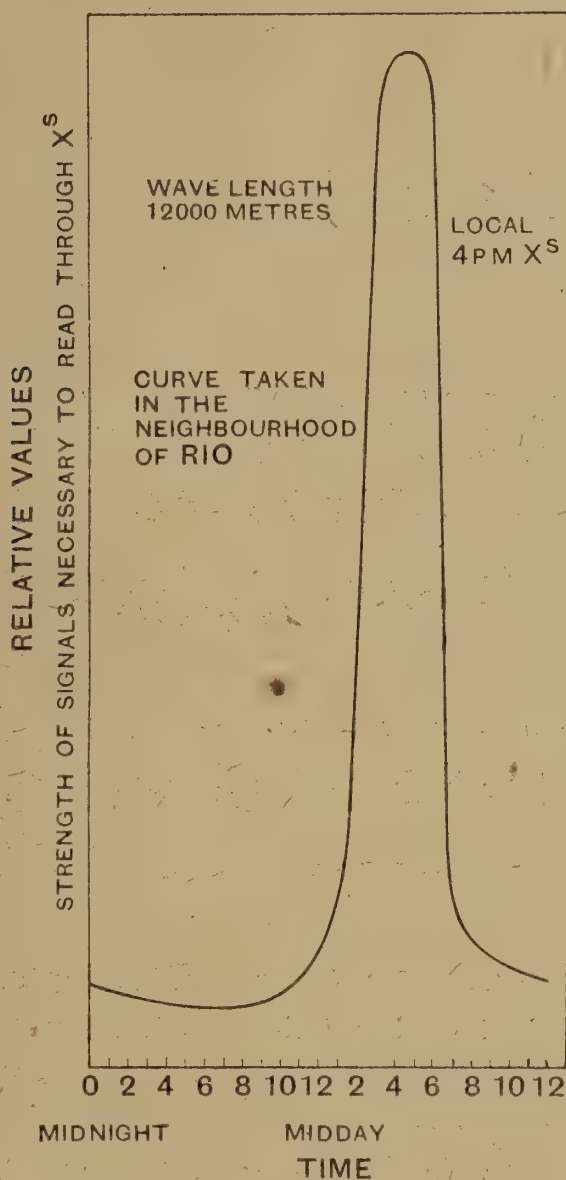


Fig. 7.

The reason for this diversity of results is quite obvious if, as previously described, we regard the X pulse as a continuous spectrum. The receiver, if sharply tuned, selects its appropriate band of waves from the spectrum corresponding to the receiving wavelength and this band behaves in every way as regards transmission as a signal of the same mean wavelength.

Thus suppose that in the neighbourhood of the origin of the X pulse the spectrum is represented by the ordinates of the curve in Fig. 8A (the abscissae being the frequency n), a receiver tuned to 20,000 will receive an impulse proportional to OP another tuned to 100,000 O'P', so that locally if the receivers are similar, they will receive practically equal amounts, but after the pulse has travelled a certain distance the higher frequencies will be attenuated and the pulse spectrum will be modified as in Fig. 8B.

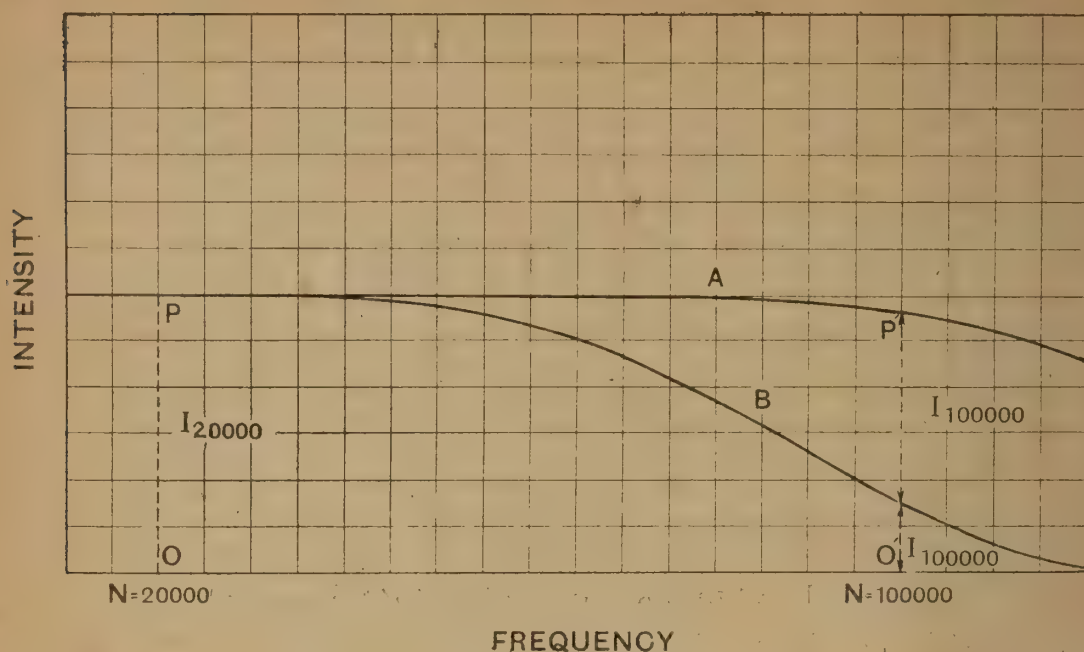


Fig. 8.

The energy received by the long wave receiver is practically unaltered, but that received by the short wave aerial is very much reduced.

It is therefore clear as stated that the short wave receiver only receives the local X's and not the distant ones. At night time, however, when the attenuation is very much reduced the X spectrum (even of those at great distances) is restored to its original form, and the distant X's come in even on the short wave receivers.

This, of course, accounts for the enormous disparity between day and night X's so often observed on short waves.

ORIGIN OF X's.

This geographical and other information although only partial, gives some indication as to the nature and origin of X's.

Some workers, *e.g.*, Greenleaf Pickard, and Weageant, in America, De Bellesize in France have attributed the origin of X's to disturbances produced in the upper atmosphere, but in my opinion the fact that their place of origin is associated with land areas, and with local barometric depressions* suggests that the majority at least originate nearer the surface of the earth, *i.e.*, within the troposphere. Although it is known that some at least are produced by lightning flashes, there is distinct evidence that others originate in local depressions where no lightning has been observed.

Some information given by the writer (in an article in the "Electrician," August 8th, 1924, p. 150) has a considerable bearing on this subject.

In this article it is shown that the instantaneous rate of radiation from average X's produced in tropical regions must be at least 40 kw.

Such an effect could be produced by a discharge of 40 amps., say, through a height of 1 km. lasting for approximately $1/20,000$ sec.

If this were caused by a lightning flash the total quantity of electricity discharged would be $4/2,000$, $1/500$ amp. sec. or $1/500$ coulomb. This is very small compared with the average quantity of electricity discharged by a lightning flash which H. A. Wilson estimates to be about 20 coulombs, *i.e.*, nearly 10,000 times as much. It therefore amounts to this: If the majority of X's are produced by lightning flashes then, fortunately, only

* See Watson Watt.

an insignificant amount of the energy radiated by such a lightning flash is available for impulsing a radio circuit, or put in another way, only an insignificant amount of energy in the spectrum of a lightning flash is distributed among the radio waves; the majority is on waves longer than 25 to 30 km.

This fact rather points to the inadvisability of using excessive long waves for the purpose of radio communication.

Although, as we have seen, the majority of X's appear to be produced near the surface of the earth there is, I think, some evidence that disturbances originating in the upper atmosphere produces X's in the manner suggested by Greenleaf Pickard, Weageant, and De Belsize. This type of X can be most readily distinguished from the ordinary one by the use of an aperiodic aerial.

If we put a suitable audio magnifying device on such an aerial a peculiar type of disturbance is heard. It is semi-musical in nature, starts with a high-pitched note, which decreases in intensity and pitch and dies away. These disturbances appear to have a duration between $1/10$ and $\frac{1}{4}$ second. They occur almost exclusively at night time in the summer, but in the winter time they may be heard before sunset. The suggestion put forward is that these electrical impulses originate in the upper atmosphere and that they owe their musical character to the dispersive nature of the upper conducting layer. This dispersion which implies that the medium transmits waves of different frequencies with different velocities, is due to the presence of the free ions and electrons which give the upper layer its conductivity. Each frequency of which the original impulse is composed travels with its appropriate group velocity. The higher frequencies with the greater velocity and the lower frequencies with lower velocity. The result is that at a considerable distance from the original source of the impulse the high frequencies arrive first and the lower ones progressively later, giving an effect to the fixed observer similar to what is actually heard.

The effect is akin to the splitting up of white light into its component pure colours by means of a prism of dispersive material.

The points of agreement between the observed results and the theory which gives support to the latter are the undoubted facts:

- (1) That the disturbance always starts with a high pitch which gets progressively lower as time goes on.
- (2) That the pitch of the note tends to a definite limit, *i.e.*, for each impulse it always approaches but never gets lower than a certain definite pitch.

Although these hardly constitute a theory they tend to confirm what we should expect, on other grounds, for according to Eccles theory, the upper medium has a very considerable degree of dispersion.

The gaps in our knowledge of atmospherics are rapidly being filled up and we may confidently look forward to the time when the energy and industry of those interested has so completed the information on this vital subject that complete data for design of radio communications will be available.

THE DESIGN OF A BROADCASTING STATION

By A. G. D. WEST, M.A., B.Sc.

IN the design and erection of a broadcasting station all the main problems experienced in erecting an ordinary wireless station are present, with modifications and additional difficulties that occur as the result of the special requirements of broadcasting.

In addition to the fact that the quality of the transmission must be very much greater than that necessary for ordinary telephone transmission, there are many points which arise on account of the fact that the broadcasting station must be situated to serve the largest number of people possible, at the same time providing a form of entertainment from the technical aspect as perfect in quality and in tone as it is attractive from the entertainment point of view.

I.

In general, it is necessary to divide the complete installation into two parts: the studio with its attendant microphones and amplifiers, and the transmitter. The reasons for this are as follows.

The broadcasting station in serving the whole of the town must be situated in a central position, but in a position where suitable arrangements can be made for erecting a high-aerial system.

Very often it is impossible to find a building that will stand the erection of high masts on its roof, and hence it is usually more convenient to make use of existing chimney stacks in preference to building a transmitting station on the outskirts of the town where space is available for erecting large masts. This is in the case of broadcasting stations of medium power. In the case of high-powered stations, of course, it is usually more convenient to erect the station some distance outside the town.

Then it is usual to place the studio in a position near the artistic centre of the town, that is close to the hall and theatre area, this being generally the most convenient part of the town for artistes. Furthermore, when it is required to broadcast transmissions from a hall or a theatre, the landlines connecting up with the control room are not too long to give the distortion inherent in the longer underground lines of a large city. The artistic centre is very often at some distance from the most suitable site for erecting the transmitter which, since the use of tall chimney stacks is a necessity, would be in the manufacturing part of the town.

Another reason for this division is that it is very often difficult to overcome the effect of the strong high-frequency field set up by the transmitter on the low frequency speech amplifiers used at the studio in conjunction with the microphones, and it is usually preferable that the latter should be at least one hundred yards from the transmitting aerial to overcome this difficulty and even then very careful screening of the amplifiers is required to avoid any possibility of a reaction effect taking place.

II.—STUDIOS.

In the early days of broadcasting when the main problem was the design of a satisfactory microphone, very highly damped studios were used, so that the effect of the walls and floor and ceiling should be minimised in estimating the performance of any particular microphone.

As broadcasting has developed it has been found most essential to introduce the correct amount of echo and reverberation for any particular item so that the most critical listener is satisfied in this respect. Unless provision can be made for a quick variation of the damping it is usually more satisfactory to have two studios, one fairly damped, with many layers of thick cloth or similar material on the walls and ceiling, the other less damped; say with periods of reverberation of about 0.2 seconds and 0.8 seconds respectively at 512 cycles.

The former studio would be used for speech, for talks and plays, where intelligibility is the most important factor. In this case satisfactory reproduction would be obtained, as regards room effects, at a distance from the microphone, say at ten or fifteen feet; this distance usually being necessary to get the most balanced results for plays where several are taking part.

The second studio would be used for all music, either solos or orchestras or military bands. The damping would depend, of course, on the volume of the studio and these figures were given for one of normal size, say 8,000 to 10,000 cubic feet.

It is very often necessary to find accommodation for rehearsals and the use of two studios allows rehearsals to take place at the same time as broadcasting is going on. The importance of rehearsals, very often underestimated, is due to the peculiar situation in which artists perform in an unnaturally damped room without an audience. When it is impossible to have two studios it is then advisable to make a compromise and arrange the damping of the studio with a reverberation period of say half a second. For instance, in the stations of the Radio Corporation of America, a period of 0.4 seconds is provided by having a special arrangement of hair felt and stretched muslin round the walls of the studio.

These points are important and must be considered in conjunction with the question of distance from the microphone, where the balance of the various musical parts and the ratio of the direct sound reaching the microphone to the strength of the reverberation are a matter of experience, or of experiment during rehearsal.

III.—MICROPHONES AND AMPLIFIERS.

The chief points in connection with the choice of a microphone are as follows :—

- (1) Equal response over the whole range of audible frequencies, that is to say, from 50 to 8,000 cycles a second.
- (2) Sensitivity.
- (3) Freedom from inherent noise or hiss.
- (4) Ease of maintenance and portability.

The main types in use in this country are :—

- (a) The magnetophone.
- (b) Stretched diaphragm carbon.

Other types in use in America and on the Continent are :—

- (c) Condenser microphone.
- (d) The glow discharge microphone.

All these types give fairly equivalent results as regards equally good production of all the required frequencies. The choice, therefore, depends in selecting the one with the least background of hiss for a given audible sound at a given distance from the microphone in a compromise with sensitivity (measured in terms of the least amount of amplification for a definite output voltage).

As regards types (a) and (b), the former is superior from the point of view of absence of hiss. The latter, however, is very much more sensitive.

Type (c) is fairly free from hiss, but is very much less sensitive than type (a) and requires a large amount of amplification.

Type (d) is the most sensitive of all, but this needs great care in operation and constant replacement of the electrodes.

When using the more sensitive types of microphone the design of the amplifiers to bring strength up to the average amount necessary to control the transmitter is usually quite straightforward, transformer coupling being avoided and resistance coupling being used wherever possible. In this way transformers are only required at the input and output of the amplifier and on the input to the transmitting set.

With the less sensitive type of microphone special care has to be taken to prevent reaction in the amplifiers by careful screening. Care must also be taken to have the valves suitably mounted or suspended to avoid "ponging" especially in the early stages, and to overcome the various changes of tone introduced by the lines between the studio and the transmitter a tone-varying device should be incorporated in the amplifier. This is also useful if any variation is required for different types of performance.

In apparatus used in the majority of the stations of the B.B.C. the total amplifier is divided into two parts, a five-stage amplifier installed close to the microphone and a second three-stage amplifier actually in the control room.

This method, of course, requires two extra transformers, one on the output of the first amplifier and the other on the input of the second amplifier, but it has great practical utility in allowing the first type amplifier to be used either at the studio or for outside broadcasts so that sufficient amplification is obtained before transferring the music or speech to the lines connecting up with the control room, the second amplifier being a control amplifier and giving the final amplification before transferring the music to the transmitter.

There are many methods of control in use. The most convenient method is obtained by converting the grid resistance of one of the resistance coupled stages into a potentiometer, the connection to the grid varying on this resistance between the earth potential end and the end connected to the intervalve condenser. The advantage of this method is that the variation of the grid switch in any position on this resistance makes no difference whatever to the tone.

Other methods that have been used are the shunting of the output of the main amplifier with a variable resistance or a potentiometer; or, in the case of carbon types of microphones, varying the current through the microphone by means of a special type of variable resistance. This latter method is often used in America when several microphones are in use at one particular place and the engineer wishes to fade in and out the sounds picked up by the various microphones.

The control of the strength output of the amplifiers is, of course, necessitated by the fact that the strength of music in a studio varies enormously and the input to the transmitter must be regulated so that on one hand it is not too great, producing grid current in the control valves and consequent distortion in the transmission; on the other hand, not too small so that modulation would be greatly reduced and the signal strength at long ranges would be correspondingly weak. Whereas the variation of the average strength of the music in the studio may be from one to a thousand times, the variation in average voltage input to the transmitter should not be greater than from one to ten times. The effect of controlling is generally to level up the strength of transmissions and this necessitates a careful watch on the part of the engineer in charge and a reserve of amplification in the set to ensure that the weakest sounds experienced can be sufficiently amplified to modulate the transmitter effectively.

Some method of checking the control is, of course, a necessity and this is done usually visually as well as aurally. The controlling engineer has either a loud speaker set or telephones operating off a checking set operating

by wireless from the transmitter. Visual methods include watching the grid current meter of the control valve system or an electrostatic voltmeter connected across the speech choke of the transmitter, or watching an oscillograph, operating in conjunction with a rectifier, from currents induced from the main aerial circuit.

For the best results in the first case the grid meter must not move. In the second and third cases amplitude must not be greater than certain definite pre-assigned values. In the case when a control room is some distance from the transmitter it is usual to install a valve voltmeter with a slideback which either measures the voltage across the output of the main amplifier or indicates when a certain voltage is exceeded. These instruments move, of course, in unison with the grid meter of the main control valves on the transmitter, and are set as required.

Great importance is attached in this country to ensuring that there is no grid current in any of the amplifying valves throughout the chain of amplification right up to the main control valves. In America and on the Continent, where really perfect quality is not laid down as a maxim, a certain amount of grid current is allowed in the transmitter, giving greater strength in a transmission but not quite such good quality. It is difficult to avoid slight grid current in the control valves for some types of speech or music where the peak voltages are perhaps ten times the average voltage and very little strength would be transmitted if grid current were rigidly avoided.

As mentioned before, there is a necessity for tone control in the amplifiers. The adjustment in the case of the B.B.C. stations is to arrange that equal audibilities of sound at the microphone produce equal voltages at the output of the main control valves, this giving equal modulation of the main oscillator valves. On account of the slight lowering of tone which is inherent in choke control circuits on account of the characteristics and output circuits of the control valves the tone in the amplifiers is raised a little to compensate for this, but in some of the American stations a special stage of amplification is incorporated, giving equal results for all frequencies, from one hundred to four thousand cycles, and four thousand to ten thousand gradually increasing amplification is produced. The curve is taken by comparison of input and output voltages throughout the whole speech frequency chain, for all frequencies.* (Fig. 1.) The idea of this is to make up

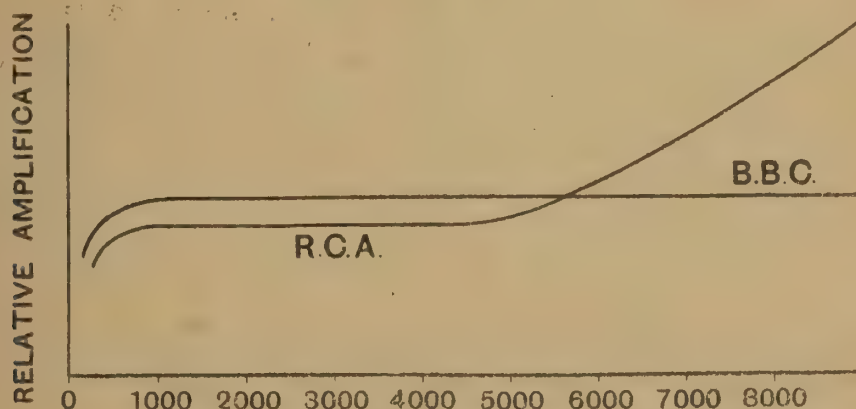


Fig. 1.—Frequency Characteristics.

for defects in the average type of receiving set operating either with loud speakers or telephones, giving with these sets better reproduction of the higher frequencies and thus resulting in the characteristic harmonics of the various musical instruments being reproduced as they should be.

* J. Weinberger, Proc. I.R.E. Vol. 12, No. 6.

The variation of the tone is not a difficult matter when using resistance capacity amplifiers by inserting capacities and chokes in the anode or grid circuits of these amplifiers, and by a proper combination it is nearly always possible to correct approximately for a distortion experienced when transmitting music over long-distance lines, provided these are suitably chosen, also when using short-distance lines in cities where the installation is mainly underground.

The methods employed in this country consist of finding a particular combination of capacities, inductances and resistances to give a good correction of the distortion experienced. A special amplifier, called a line amplifier, is used for this purpose with the variables as shown (Fig. 2), the combination of input apparatus at the far end of the line, the line itself and the correcting amplifier being a means of transmission giving equal results for all frequencies from 50 a second to 8,000 a second. When certain definite lines are continuously in use it is usually possible to set these amplifiers at some definite value which will give the required correction, though this, of course, must be frequently checked.

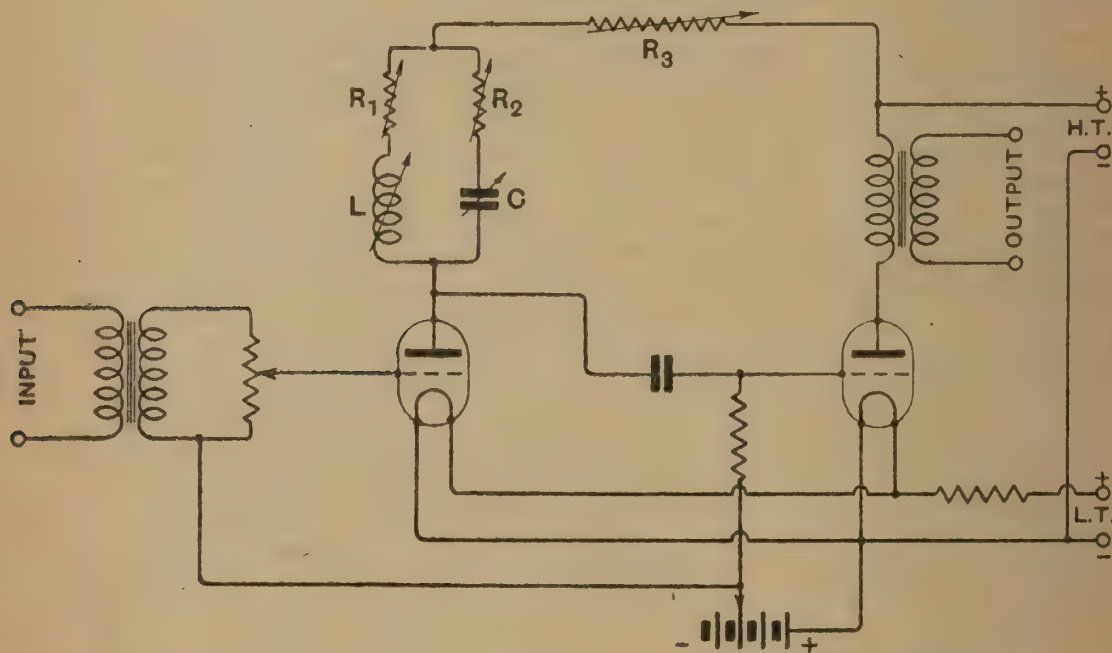


Fig. 2.—Correcting Amplifier, L , C and R 's Variable.

In America when lines are used for outside broadcast the correction is obtained by means of what is called an attenuation equaliser at the microphone end of the line which, while not employing valves, acts as a kind of filter circuit in correcting for the loss of strength on the higher frequencies. It is with non-loaded cables that these are mostly used; in fact it is generally specified that either non-loaded cables or continuously loaded cables should be used for broadcasting purposes when underground lines cannot be avoided. Very often an equaliser is also used at the receiving end, that is, in the control room.

As regards the design of the apparatus at the microphone end, in the case of outside broadcasts, when long-distance lines or long underground lines are in use, it is often necessary to use an output transformer for the microphone amplifier with a low impedance output winding. If the usual output impedance of between 500 and 1,000 ohms used in ordinary telephone work is used, a considerable lowering of the tone is experienced and for broadcasting work it is essential to have a transformer with a winding of a much lower impedance.

The arrangement for bringing lines into the control room can be modelled on usual telephone practice and by having two line amplifiers and paralleling their outputs and making full use of their control potentiometers, the most artistic effect can be obtained by fading in and out various items. One wants to reduce as far as possible all unnecessary noises such as those occurring in the studio between items when artists are moving to take up their positions, and microphone clicks when switching in and switching from one microphone to another, for instance, when two microphones are used in one studio, one for the artistes and one for the announcer.

By arranging things suitably in this way it is also possible to superimpose the transmissions and to obtain many combinations which give a very attractive effect. An important point that has not yet been mentioned is in connection with the wiring up of various amplifiers, microphones and switchboards. It is usually essential on account of the great amount of amplification employed to screen all the various leads very carefully. It is generally sufficient to run fixed leads through ordinary electric lighting conduit, but this should be earthed at many points.

As regards moveable leads such as those connected to microphones in the studio, these should have suitable gauze or flexible metal covering which is connected to the microphone case or cover and also earthed. Even when the electric supply is direct current it is often very difficult to eliminate entirely the induction hum. Sometimes even with all these precautions this hum has occurred as a result of a leakage to earth of some local electric supply and when a studio is in a city and surrounded by neighbouring dynamos or other electrical machinery or overhead power lines, it is sometimes extraordinarily difficult to eliminate all the effects due to their running and starting and stopping. Lifts and electric signs are often very troublesome in this respect.

A point in connection with this is to have the first stages of amplification as close as possible to the microphone; if not actually in the studio, just outside it. The leads to the microphone should be as short as possible.

As regards the actual design of the amplifiers, suitable valves must be chosen to be worked with the right high tension voltage and grid negative potential to correspond with the voltage strengths to be dealt with at their respective positions in the amplifier. The usual output voltage transmitted over the line either from the control room to the transmitter or from outside broadcast to control room is something of the order of 2 to 5 volts. High tension is usually supplied by high tension accumulators which are very satisfactory in use and have a very long life, but in cases where the transmitter is close to the studio the main high tension supply can be used for supplying high tension to the amplifiers, the right voltages being obtained by potentiometers. With suitable filtering no hum or ripple is experienced in making use of this method.

IV.—TRANSMITTER POWER SUPPLY.

The question of the correct method for supplying power depends, of course, on the type of power that is available. On the whole it is generally preferable for transmitters of all powers embodying high voltage valves to obtain an A.C. supply; transform it up and use diode rectifiers and full wave rectification to give the required high tension.

It is better to use alternators giving a much higher frequency than the usual local supply, say, up to 500 cycles, the smoothing being then less difficult.

If a supply of three-phase A.C. can be obtained so much the better as not so much smoothing is required after rectification to cut out the ripple.

On stations up to 1 kilowatt in power the use of high tension generators up to 4,000 volts is quite practicable and although the design of these is somewhat difficult and great care has to be taken in the manufacture, results on the whole are quite satisfactory.

In the case of really short wave transmission of the order of 100 metres it is usually essential to have a high tension generator, and for powers greater than 1 kilowatt very great difficulty is experienced in smoothing out the supply when transformed A.C. is used. In this case, of course, it is always most advisable to use three-phase supply. This supply can also be used for lighting the filaments of the rectifiers.

There have recently been developments in the direction of employing low voltage valves in high power sets, these being successfully operated by generators giving voltages of the order of 2,000.

For supply of filament current, for the transmitter valves, large storage cells are adequate for stations up to 5 kilowatt power. For greater powers, D.C. generators must be used and special attention given to the smoothing of the supply, especially that to the subcontrol filament.

One of the main difficulties in maintaining the quality of transmission is that of overcoming the hum in the carrier wave which may be due to dirty brush contacts or an unbalanced armature of the H.T. generator; in the case of an A.C. supply, to insufficient smoothing.

V.—DRIVE AND OSCILLATOR SYSTEMS.

In designing the oscillator system for a broadcasting station it is essential to decide whether it will be necessary to employ a master oscillator. In general this consumes what might appear to be an unnecessary amount of power, but it is on many of the finer points in transmission that the use of the drive becomes evident. One can compare drive systems with systems where the main power valve is a self-oscillator and the main reasons for employing the drive are as follows :—

- (1) The wavelength is maintained absolutely constant; that is to say no variations of wavelengths are caused by swinging of the aerial or other slight changes in the oscillator circuit. For stations which are supposed to cover a large range this may not be a necessary reason, but it has been definitely proved that at long distances, for instance say at over sixty miles from a main British station, a certain amount of night distortion is experienced when a drive is not in use. The reason for this is that the reception is a result of the combination of the direct and reflected waves, and a slight variation in wavelength in the transmitter causes a heterodyne at the receiving end on account of the different lengths of path of the two waves.
- (2) The percentage of modulation apart from merely a consideration of the control valves is increased by this method, because the power valve acts as a high frequency amplifier at all voltages from almost zero to twice the main high tension voltage, whereas in a self-oscillator system this valve will not oscillate below a certain voltage, thus limiting the amount of modulation allowable.

As regards the amount of power to be employed in the drive valve, it is generally best to make this a large fraction of that used by the main power valve, say half or one-third, and then to use loose coupling between the output circuit of the drive valve and the input circuit of the main power valve. This lessens the possibility of any action on the drive circuit by any slight changes in the values of the main power valve circuit.

It is only among the British main stations and a few of the Continental stations that a drive circuit is used. British relay stations do not employ a drive as their power is small and they are only supposed to feed a limited local area, so that the effect of long distance need not be considered.

In America very rare use is made of a drive for broadcasting purposes, practically all the stations that are now set up employing straightforward self-oscillator circuits. The use of a quartz crystal oscillator for this purpose is, however, being developed with some success, the crystal being a mechanical oscillator and therefore free from the action of the field due to the main oscillatory circuit, the elimination of this action being the chief difficulty in the successful operation of a drive circuit.

VI.—METHODS OF MODULATION.

There are two chief methods : (1) grid control in many forms ; (2) choke control. Much has been said about their respective merits. It is generally a question of economy of power against perfect quality. The criterion should be, of course, that the variation of aerial current should be linear with the variation of voltage input in the control valve within the limits of modulation. Generally speaking, grid control does not satisfy this condition well. Also, it does not give so great modulation without distortion and breaking as the choke control method.

Furthermore, grid control introduces a continuous variation of frequency, an effect which we have discussed before. It is, of course, very much more economical as regards power input for given power in the aerial circuit, but this form of economy is a false one in that it should be the aim of every broadcasting station to transmit the very best quality possible, and stations that employ grid control suffer from the defects of low modulation for minimum distortion, long-distance night distortion, change of frequency and unequal transmission for various frequencies. Nevertheless this system is employed extensively for broadcasting stations on the Continent. Fig. 3 shows the circuit in use at several of the German stations and also at Vienna. The control valve acts as a variable damping in the grid circuit.

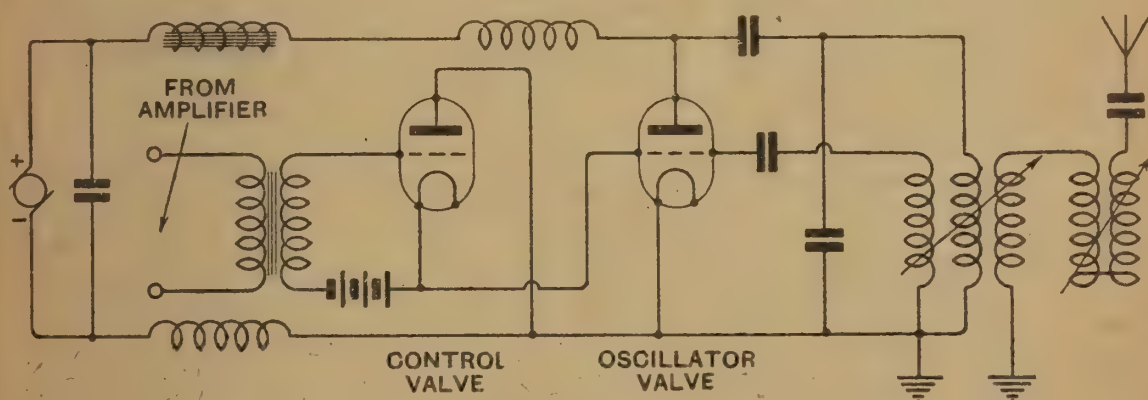


Fig. 3.—Grid control circuit in use at German Stations.

Another method of grid modulation is in use at Radio-Paris where a magnetic modulation transformer in the grid circuit varies the voltage in that circuit. This has proved to be fairly satisfactory on high power on long wavelengths, but it does not give such good quality transmission as the choke control method.

Choke control is used extensively in this country and in America. By the suitable design of the control valves and of the speech choke it is possible to obtain a very high degree of modulation consistent with perfect quality; something of the order of 70 per cent. to 80 per cent. Furthermore, it gives a straight line variation of aerial output with respect to voltage input on the control valve at speech frequencies.

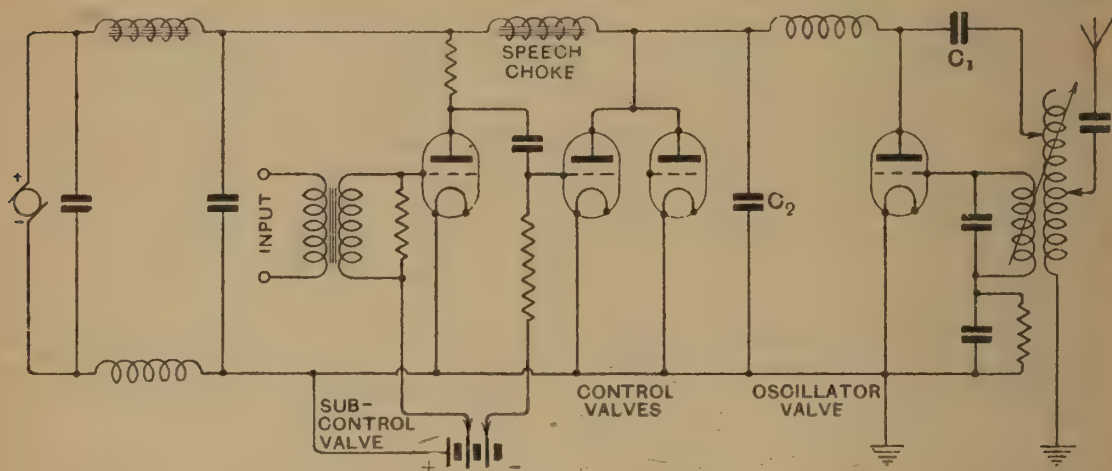


Fig. 4.—Normal Choke Control Circuit.

There is, however, likely to be a slight lowering of the tone in the transmission, due to the presence of the speech choke by-pass condenser and the anode stopping condenser and the capacities of the valves, these reducing at the higher frequencies the impedance of the output circuit of the control valves. These condensers should, therefore, be as small as possible consistent with their proper functioning; say of the order of .0003 mfd. for normal broadcasting wavelengths.

The following points should be noted with regard to this system:

- (1) The total power taken by the control valves should at least equal the power taken by the oscillator.
- (2) The circuit can be represented by the diagram in Fig. 5.

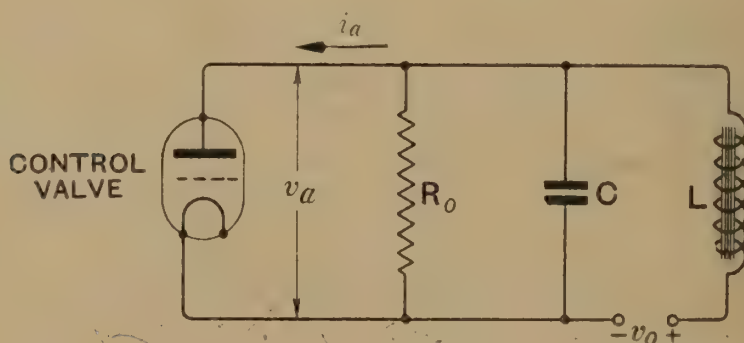


Fig. 5.—Representation of Choke Control Circuit.

R_0 represents the oscillator valve.

$C = C_1 + C_2 + \text{stray (including valve) capacities.}$

L represents the speech choke.

(3) Working out this diagram for any particular frequency it is found that the representative point on the $v_a i_a$ graph travels on an ellipse with centre at $v_0 i_0$, the point of setting of the control system, and with conjugate axes parallel to the line $v_a - v_0 = R_o (i_a - i_0)$ and the v_a axis (Fig. 6).

(4) To avoid blasting, that is departure from linearity of amplification, the representative point should not enter the region of grid current or rectification (shown by shaded parts) for any of the frequencies under consideration.

(5) These considerations determine suitable valves for the speech choke and the two condensers C_1 and C_2 ; also the best point at which to set the grid potential. They also show the percentage of modulation obtainable with this particular control system under these conditions. Generally in coming to practical considerations a compromise must be made as regards the various factors. For instance, a speech choke should have the least resistance and greatest inductance for a given size allowable. A practical value for the inductance would be 100 henries. For high powers where the amount of iron required is enormous a speech transformer can be used with the currents to the modulator and oscillator flowing in opposite directions so that the size can be greatly reduced.

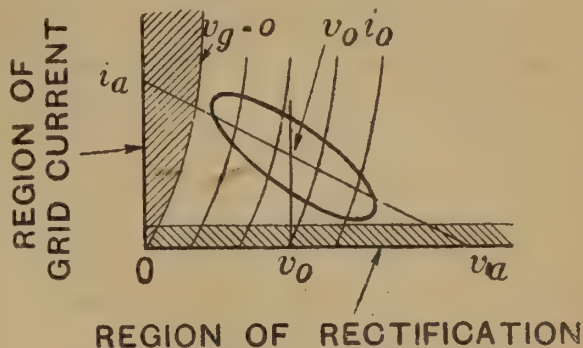


Fig. 6.—Graph for Control System.

(6) The reduction in impedance of the control system gives a greater possible percentage of modulation, but a compromise must be made between this and a consequent reduction in the magnification factor.

(7) With suitable design a modulation of 80 per cent. can be obtained.

It would be as well to mention here a method that is used for higher powers in America, namely, high frequency magnification of the modulated oscillations generated in an ordinary choke control circuit. In other words this amounts to modulation of the drive. An arrangement is sometimes made to add a high frequency magnifier panel on to a standard broadcasting set when an increase of power is desired. This method necessitates very careful design, but it is quite a practicable one.

VII.—OSCILLATOR AND AERIAL CIRCUITS.

Two general types of circuits are in use. First of all the ordinary reaction circuit with direct or loose coupling to the aerial; secondly, the Hartley type of circuit; reaction, anode and aerial circuit are all tapped off on coil. In the latter case, of course, loose coupling to the aerial circuit may be used. In either circuit it is quite possible to arrange by means of ratio windings for the anode tap to have the most efficient conditions for the oscillating circuits. This is in accordance with the usual practice for valve transmitting sets. Fig. 7 shows the arrangement of the circuits when a drive is used. The coil or part of coil, marked "R" in the figure, corresponds, of course, to the reaction coil in the self-oscillating circuits or to the anti-reaction coil in drive circuits; the latter always being necessary to compensate for the capacity in the main power valve system and its tendency to self-oscillation, so that this system is rendered a true high frequency magnifier.

It is essential, of course, that with all these various adjustments, the transmitter should be adjusted to be perfectly stable.

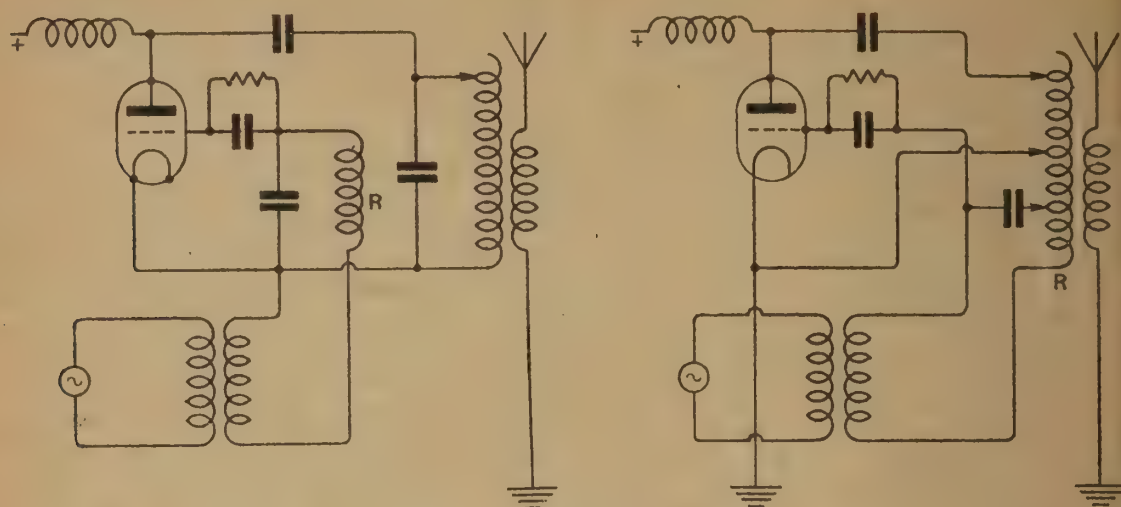


Fig. 7.—Oscillator Circuits.

VIII.—AERIALS.

Generally speaking the aerial should be as high as possible with a fairly high capacity flat top. If the station can be erected close to two tall chimneys the best result is achieved by having a "T" or "L" type of aerial, the down-lead being as vertical as possible. When, however, one chimney only is available it is usually best to extend the aerial from the top of a chimney in another direction, so that a good high capacity is obtained. This top extension, by increasing the effective height, often adds very considerably to the range without increasing unduly the difficulty of operating the transmitter on a short wavelength.

A curious effect is noticed when chimneys have metal linings, as the majority of them do. In this case very considerable absorption may take place, also the production of curious harmonics in the transmission due to the chimney itself resonating at certain definite frequencies.

This system of aerial and chimney may also have a tendency to act as a kind of frame, the connection being through the metal halliard, giving a directional transmitting effect. It is, therefore, essential that the aerial should be kept as far from the chimney as is consistent with maintaining good height. A vertical or nearly vertical aerial has often to be sacrificed for an aerial at say 40° from the vertical, and if a top hamper is used this can be made also to fulfil the purpose of a guy rope pulling the main part of the aerial away from the chimney. It is necessary to take particular care with regard to the insulation and the part of the halliard between the chimney and the aerial itself should also be broken at intervals by insulators.

A similar effect is observed when aerials are erected with steel masts on steel frame buildings. Unless great care is taken with regard to the arrangement of the halliards this system may very easily act as a very directional transmitter and in the directions at right angles to the plane of the masts and aerial system very bad reception may be experienced. This has occurred with a very marked effect in two or three cases, necessitating the complete re-design of the aerial system.

Incidentally, in considering steel frame buildings, it might be mentioned that these directional effects are not by any means only due to the actual building on which the aerial is mounted. Neighbouring tall buildings may account for a great deal of absorption, and in some towns where a large number of buildings are constructed in this manner it is very often difficult to get satisfactory radiation in certain directions.

Some very interesting curves were taken of the radiation from certain New York stations, these curves being plotted as contour lines on a map giving points of equal signal strength. It was shown that in certain directions from the transmitter reception even at quite short distances away was very poor indeed, on account of local absorption.

Very often, however, a steel frame building may act as a most efficient earthing system and many stations that have been erected in this way have proved to be very satisfactory. In these cases, of course, the transmitter is erected on the roof and the whole building and the aerial system may very possibly be acting as a huge Hertzian oscillator.

When a direct earth has to be used it can be taken as a general rule that the earth-lead should be as short as possible ; the transmitter thus should be on the ground floor.

In the case of the eleven relay stations that have been erected by the B.B.C. those with the shortest earth-leads have given the most satisfactory results, independent of the height and constitution of the aerial ; the method used being to bury very large copper earth-plates under the transmitter ; the lead being brought up through a drain pipe direct to the transmitter earth terminal. It is thus possible in dry weather to keep the earth moist by pouring water down the pipe and this maintenance of an efficient earth has the satisfactory result of keeping the radiation of the set practically constant under all conditions.

When it is impossible to obtain a really good earth of this nature, for instance if the station is built on a rocky or hard subsoil, a counterpoise will have to be used and this should occupy as large an area as possible in all directions under the aerial, a difficult matter to arrange when the transmitter is situated in the middle of a town.

IX.—DIFFICULTIES IN THE INSTALLATION OF TRANSMITTERS.

The chief difficulties in trying to keep good radiation for a given power lie in dealing with instability in the speech frequency or high frequency circuits of the transmitter and the elimination of hum due to various causes that have been mentioned before.

Apart from a long earth lead giving bad radiation it may also cause a good deal of hum in the transmission due to the fact that the bottom of the aerial circuit inductance is not an earth potential. In this case the leads to the low tension accumulators or to the dynamos or transformers may be acting as a kind of counterpoise and if not sufficient care has been taken in the smoothing of the high tension supply, from a high frequency as well as from a low frequency point of view, a hum may be set up in the carrier wave due to high frequency passing through the generators or rectifier system.

The way to overcome this difficulty is to insert high frequency chokes in the high tension leads where these leads are connected to the set ; also two small condensers in series across these leads with a centre point earth may assist. In working a station it is very useful to have several additional high frequency chokes available so that experiments can be made in connecting them at various points.

It is usual not to connect the frame and filaments of the set to the main earth but to a subsidiary earth connection which need not be so efficient an earth as the main earthing system.

Sometimes it is advisable to use separate earths even for the filaments and the frame of a set and in other cases it has been found useful to connect high frequency chokes between the frame and the filaments and between the filaments and the bottom of the main aerial inductance when these separate earth connections are used.

The various power leads, such as low tension and high tension, should be brought to the set in lead-covered cable and this covering should be earthed at many points.

When a satisfactory condition has been obtained, as far as the high frequency circuits are concerned, it is sometimes found that interaction takes place between the high frequency circuits and the speech circuits, high frequency getting back on to the control circuits and even on to the line connecting up with the studio. There may even be a low frequency oscillation set up in the speech circuits owing possibly to the use of the same high tension supply for the sub-control valve as for the control valves. In this case, if no re-arrangement of the set effects a cure, some form of damping must be used to overcome this tendency to self-oscillation, perhaps by the insertion of a series resistance in the main high tension lead to the anodes of the control valves. It is advisable to have also a high frequency choke in this position.

As regards the speech input of the set where the lines from the studio are connected it is advisable to provide here a system of high frequency chokes and condensers similar to those described previously in connection with the high tension circuits. This also may assist in balancing the line, though it is not likely that underground short-distance lines would become unbalanced. But when an overhead wire system exists and this must be made use of for connecting up with the studio, it is very essential to make sure that no radio frequency currents are set up in this line. The line should be shielded at least up to one hundred yards away from the transmitting aerial and when it is impossible to bury it for this distance lead-covered wire should be used and it should be hung in the usual manner for heavy overhead wires. When these methods are not effective in cutting out entirely induced radio frequency currents, wavetraps tuned to the frequency of the transmitter can be inserted in the lines and generally all these precautions will give satisfaction even in the most obstinate cases.

X.—GENERAL REMARKS.

So far we have considered the lay-out of a broadcasting station from a technical point of view. To maintain a good service many practical details must be taken into consideration and the design of the control room must, of course, be modified by these requirements. For instance, to avoid breakdowns in the service adequate provision must be made for duplication in the apparatus. In British stations complete duplicate sets of apparatus are provided for microphones and amplifiers it being possible to change over instantly from one channel to another in the event of any fault developing.

As regards transmitters, the high tension generators or alternators and transformer supplies are duplicated, also the high tension smoothing and low tension filament batteries. A change-over can be made instantly. Special arrangements are also made for very rapid change-over of valves in the transmitter panels. In some of the American stations even the transmitters themselves are duplicated and the only part of the complete chain from microphone right through to aerial system that is not duplicated is the aerial itself.

By a careful design of plug and jack arrangements and switching the changing over arrangements can be facilitated. In some cases this change-over is accomplished by means of automatic relays which carry out all the various operations of switching off all the components of one set and switching on for the other set and making the necessary change over.

In designing a broadcasting station it is necessary to study very carefully the various points that have been enumerated; in particular, the transmission of perfect quality, freedom from noise, maximum radiation for given power, and maintenance of the service. In this way only can good results be obtained at the receiving, as no modification in the receiver can make up for faults in the transmitter.

PARTICULARS OF COMPANIES ENGAGED IN THE COMMERCIAL DEVELOPMENT OF WIRELESS TELEGRAPHY & TELEPHONY

Aktieselskabet Internationalt Radiotelegraf & Telefon Compagni (Irotco).

Registered.—June 30th, 1920, June 30th, 1923, and August 21st, 1925.

Head Office.—Ny Vestergade, Copenhagen.

Directors.—K. Zieler (Chairman), H. Siegmund, Einer G. Guildal, S. Bahs, H. Haagenen.

Managing Director.—Hakon Haagenen.

The Company was formed for the purpose of the construction and manufacture of radiotelegraphic and radiotelephonic apparatus of all kinds for land, as well as sea and air.

Sole Sales Agents for Sterling Telephone & Electric Co., Ltd., London.

Amalgamated Wireless (Australasia), Ltd.

Incorporated.—July 11th, 1913, in the State of New South Wales.

Head Office.—"Wireless House," 97, Clarence Street, Sydney, New South Wales.

Melbourne Office.—Wireless House, 422/4, Chancery Lane, Melbourne, and Collins House, Collins Street, Melbourne, Victoria.

New Zealand Office.—"Australasia Chambers," Customs House Quay, Wellington, New Zealand.

Directors.—Sir William Vicars, C.B.E., Rt. Hon. W. M. Hughes, K.C., E. T. Fisk, Esq., Member I.R.E., C. P. Bartholomew, Esq., G. Mason Allard, Esq., F.C.P.A. (Chairman), W. T. Appleton, Esq.

Managing Director.—Ernest T. Fisk.

Assistant Manager and Secretary.—J. F. Wilson, A.C.I.S.

Accountant.—F. W. Larkins, A.I.I.A., A.C.I.S.

Transocean Radio Service:—Chief Engineer, Traffic Manager, and other Executives to appointed.

Coastal Radio Service:—Manager.—L. A. Hooke. **Superintendent.**—G. Weston.

Marine Radio Service:—Traffic Manager.—J. L. Mulholland. **Equipment Manager.**—D. Campbell.

Radio Concert Service:—Temporary Staff.

Radio Electric Works:—Manager.—S. M. Grime. **Assistant Manager.**—E. A. Horner.

Technical, Research and Patents Department:—Superintendent.—G. Apperley.

Branch Managers.—L. A. Hooke, Victoria. G. Robertson, New Zealand.

Capital.—Authorised, £1,000,000. Subscribed capital issued, June 30th, 1922 :—

181,400 Fully paid shares	£181,400 0 0
804,118 Shares paid to 2s.	80,411 16 0

£261,811 16 0

The Company has acquired an exclusive and perpetual licence to use and exploit in Australia and New Zealand, together with certain rights in other British territories in the Pacific and Indian Oceans, the present and future patents of Marconi's Wireless Telegraph Company, Ltd., London, and Radio Corporation of America, as well as the Telefunken system, and a prominent French system. It also has rights to the patents of the Poulsen Pedersen arc system.

Of the 1,000,000 ordinary shares, 500,001 shares are held by the Commonwealth Government. The Board consists of seven Directors, three appointed by the Government, three appointed by the private shareholders, and a seventh Director elected by a majority vote of the other six, or appointed by arbitration. In September, 1922, the Prime Minister of the Commonwealth, Rt. Hon. W. M. Hughes, K.C., was nominated by the Cabinet for the position of seventh Director, and unanimously elected by the other Directors.

An agreement was made in March, 1922, between the Commonwealth Government and the Company, providing for the establishment of direct wireless communication between Australia and Great Britain; feeder services between the main trunk station and the capital city of every State; re-organisation and re-equipment of the existing coastal service, and for the future development of all branches of wireless communication within Australia and between Australia and countries over seas. In the event of an outbreak of war, the entire organisation of the Company will become a unit of the defence forces of the Commonwealth.

The Company has an extensive manufacturing works in Sydney, in which all classes of radio apparatus, including electronic valves, are produced; it owns and operates 28 wireless stations within the Commonwealth and its territories, in addition to 200 stations on board Australian and New Zealand ships.

Accounts.—The accounts are made up to June 30th in each year. The profit and loss account for the twelve months ended June 30th, 1924, shows that the gross profit from trading and revenue from wireless stations amounted to £70,134 15s. 9d., and after deducting all expenses and providing for reserves, there was a net loss of £21,856 19s. 3d. The reserve accounts at June 30th, 1924, stood at £52,414 8s. 4d.

Dividends.—1913-14, 4 per cent. 1914-15, 6 per cent. 1915-16, 5 per cent. 1916-17, 5 per cent. 1917-18, 5 per cent. 1918-19, 5 per cent. 1919-20, 5 per cent. 1920-21, 6 per cent. 1921-22 6 per cent.

American Radio and Research Corporation

Incorporated.—June 15th, 1915.

Main Office and Works.—Medford Hillside, Mass.

District Offices.—15 Park Row, New York City; 1015 Chestnut Street, Philadelphia, Pa.; 803 Commerce Building, Kansas City, Mo.; 515-13th Street, Oakland, California.

Directors.—Harold J. Power, Louis B. King, Ernest P. Gage.

President and General Manager.—Harold J. Power.

Secretary.—Louis B. King.

Authorised Capital.—\$1,250,000.

Issued.—\$1,000,000.

Dividends.—Close corporation.

Trademark.—AMRAD.

This Corporation operates the world's oldest broadcast station, WGI. It was erected in 1915. The Corporation also designs and manufactures radio receiving sets, receiving and transmitting specialities, and Government wireless telegraph and telephone apparatus.

British Broadcasting Company, Ltd. (The)

Founded.—1922.

Head Office.—2, Savoy Hill, Victoria Embankment, W.C.2.

Directors.—Lord Gaihnford (Chairman), Rt. Hon. F. G. Kellaway, P.C., John Gray, Henry M. Pease, Sir Wm. Noble, Basil Binyon, Archibald McKinstry, Sir Wm. Bull, Bart., M.P., W. W. Burnham.

Managing Director.—J. C. W. Reith.

Chief Engineer.—P. P. Eckersley.

Secretary.—G. V. Rice, M.A., A.C.A.

Capital.—Authorised 100,000 $7\frac{1}{2}$ per cent. cumulative ordinary shares. Issued (to March 31st, 1924), 67,858 cumulative ordinary shares.

The shares may be allotted or disposed of as the Board may determine, provided that the Board shall not, without the previous written approval of the Postmaster-General allot more than 60,000 shares in the united capital to the following six companies or their nominees:—

Marconi's Wireless Telegraph Company, Ltd.

Metropolitan-Vickers Electrical Co., Ltd.

Radio-Communication Co., Ltd.

British Thomson-Houston Co., Ltd.

General Electric Co., Ltd.

Western Electric Co., Ltd.

and that the Board shall, up to a total of 39,994 shares, issue to applicants, being *bona fide* British manufacturers of wireless apparatus other than the above six companies, the full amount of shares (not exceeding 10,000 to any one applicant) for which applicants may apply.

Chinese National Wireless Telegraph Company (The)

Incorporated.—Under Special Charter by virtue of an agreement dated May 24th, 1919, between the Government of the Republic of China and Marconi's Wireless Telegraph Company, Ltd.

Head Office.—25 Ta-yang-i-pin Hutung, Peking.

Shanghai Office.—5 Peking Road, Shanghai.

Factory.—LL-738 Thorburn Road East, Shanghai.

Directors.—Lieut.-General M. K. Tinn (Chairman), Rear-Admiral N. T. Chen, S. Y. Tsoh, Godfrey C. Isaacs, T. A. Barson, A. H. Ginman (Vice-Chairman and Managing Director).

Secretary.—Sohtsu G. King.

Accountant.—M. C. Cheng.

Works Manager.—R. F. Cave, Shanghai.

Branch Manager.—W. J. Richards, Shanghai.

Capital.—Authorised £700,000 in 700,000 shares of £1 each.

The Company was formed to manufacture, sell and maintain wireless telegraph and telephone apparatus in China, and has been granted a licence by Marconi's Wireless Telegraph Co., Ltd., giving the sole right to use in China all the Marconi Company's Patents, present and future, for wireless telegraphy and telephony.

Compagnie Générale de Télégraphie Sans Fil

Incorporated.—February 5th, 1918.

Head Office.—79, Boulevard Haussmann, Paris.

Directors.—H. Bousquet (President), Baron de la Chevrelière (Vice-President), E. Girardeau, A. L. Atthalin, M. Bloch, A. Dupont, E. May, N. Pietri, E. Sins, Paul Gauthier, L. Wibratte, Baron Jacques de Gunzberg.

Managing Director.—E. Girardeau.

Chief Engineer.—Major Brenot.

General Secretary.—R. Tabouis.

Capital.—62,500,000 francs, divided into 125,000 shares of 500 francs each, subscribed and fully paid; 32,000 Parts Bénéficiaires have also been issued.

The financial year ends December 31st.

Compania Marconi de Telegrafia Sin Hilos del Rio de La Plata

Incorporated.—August 4th, 1906.

Head Office.—Calle San Martin 459, Buenos Aires, Argentina.

Directors.—Captain G. J. Nunes (President), Godfrey C. Isaacs, Senator G. Marconi, G.C.V.O., LL.D., Señor Duncan Munro, Sr. Roberto Delacre, Señor Enrique Schlieper, Sr. E. Rivera, Dr. Francisco di Carlo, Sr. Jacinto Z. Caminos, Sr. Felix Ponsati.

Treasurer.—Enrique Schlieper.

Secretary.—Jacinto Z. Caminos.

Auditor.—Herbert K. James.

Engineer.—E. Berry.

Capital.—\$2,000,000 gold, represented by 250,000 shares of \$5 gold each, series "AA," fully paid, and 150,000 Preference shares, 5 per cent. (non-cumulative) of \$5 gold each, series "BB," 35 per cent. has been called up on the "BB" shares. The balance is payable in instalments of 10 per cent. with not less than thirty days' notice. The financial year of the Company ends on May 31st.

Companhia Nacional de Communicações Sem Fio

Incorporated.—March 29th, 1922.

Head Office.—107, Rua 1º de Marco, Rio de Janeiro.

Directors.—Dr. Rodrigo Octavio Filho, Jack Maurice.

President.—Dr. Rodrigo Octavio Filho.

Managing Director.—Jack Maurice.

Capital.—Rs.600:000\$000 divided into 6,000 shares of 100\$000 each.

The objects of the Company are to exploit various patents of the Marconi Co., as also to act as agents for them.

Compañia Nacional de Telegrafia Sin Hilos

Incorporated.—December 24th, 1910.

Head Office.—Calle de Alcalá, 43 Madrid.

Branch Office.—Ronda de la Universidad, 35, Barcelona; B. Aires, 13, Bilbao.

Directors.—Excmo. Sr. Don Francisco Setuain, Excmo. Sr. Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., Excmo. Sr. Don Antonio Comyn, Conde Vo. de Albiz, Don. A. Galvez Canero, Don Carlos de Albert Despujols, Excmo. Sr. Don Eduardo Estelet, Sr. Don Jaime Macnaughtan, Don. Julio Rodrique z Moruelo.

Secretary.—Sr. Don Jose Asensio.

Capital.—6,500,000 pesetas divided into 8,000 6 per cent. participating preference shares of 500 pesetas each, and 5,000 ordinary shares of 500 pesetas each, all issued and fully paid.

The financial year ends on December 31st.

This Company took over the concession from the Spanish Government for the construction and exploitation of a public wireless telegraph service in Spain and its colonies. The Company has ten wireless telegraph land stations erected and working at Aranjuez, near Madrid, Cadiz, Barcelona, Tenerife, Las Palmas, Vigo, Soller, Finisterre, Santander and Cape Palos, and has further stations in course of construction. The Company holds an exclusive licence from Marconi's Wireless Telegraph Co. to use and exploit its patents in Spain and her colonies.

The Company has established a direct wireless telegraph service between Spain and England *via* Madrid and Barcelona and London, with Germany *via* Madrid and Barcelona and Nauen, with Austria and Hungary *via* Barcelona and Budapest, with France *via* Madrid and Barcelona and Sainte Assise, with Italy *via* Barcelona and Rome, with Switzerland *via* Madrid and Berne, and with North, Central and South America *via* Madrid and Barcelona and London-Marconi.

The station at Barcelona works with England, France and Germany in order to handle the traffic rapidly from the Catalanian region. Moreover, very important improvements, for instance, high speed duplex transmission and reception, have been introduced and are still being adopted at Madrid and Barcelona station with a view to further increasing the efficiency of the International services.

Arrangements are under way to establish a duplex service with Portugal.

Compagnie Radio-France

Head Office.—79, Boulevard Haussmann, Paris.

General Offices and Showrooms.—166 Rue Montmartre, Paris.

Administrative Council.—Messrs. Jules Cambon (President), Henri Bousquet (Vice-President), E. Girardeau, N. Pietri and L. Wibratte (Managing Directors), M. Bloch, Baron de la Chevreliere, A. Dupont, P. Gauthier, A. Laurent-Atthalin, E. May, H.-V. Mehu (Directors).

Managers.—Administration and Finance, M. Tabouis. Technical, M. Garnier. Commercial and Publicity, M. Hoche.

Capital.—60,000,000 francs.

The Company owns the great Radio Transmitting Station of Ste. Assise with its corresponding receiving station at Villecresnes (S. et O.), and maintains public radio communication with Great Britain, America, Spain, Roumania, Czecho-Slovakia, etc.

Compagnie Radio-Maritime

Incorporated.—April 24th, 1919.

Head Office.—79 Boulevard Hausmann, Paris.

Agencies at Havre, Marseilles, Bordeaux, St. Nazaire, Dunkerque, Rouen, Algiers, Boulogne-sur-mer, Lorient, La Rochelle, Arcachon, St. Pierre and Miquelon.

Directors.—Messrs. Bousquet (President), Baron de la Chevreliere (Vice-President), N. Pietri, E. Girardeau, E. Sins, Dal Piaz, Musnier, Max Robert and Léon Barthou.

Managing Director.—M. N. Pietri.

Manager.—M. A. Dalix.

Sub-Manager.—M. R. Girardeau.

Capital.—7,000,000 francs, divided into 70,000 shares of 100 francs each.

Objects of the Company.—The purchase, sale, installation, maintenance and operation, in France and abroad, of all kinds of wireless, telegraphic and telephonic apparatus and component parts thereof for commercial, ship or aviation purposes.

Companhia Radiotelegraphica Brasileira

Incorporated.—August 14th, 1919.

Head Office.—107 Rua 1^a de Março, Rio de Janeiro.

Directors.—A. Bucken, Dr. Pedro A. Nolasco, W. G. Lush, Jack Maurice, Dr. Rodrigo Octavio Filho, and L. Thiebert.

President.—Pedro A. Nolasco Pereira da Cunha.

Members of the Fiscal Council.—Senor Joao Gentil de Mello Araujo, Senor Henrique Lage, Sir Henry Lynch, K.B.E.

Council of Administration.—A. Bucken, W. G. Lush, Jack Maurice, L. Thiebert, Dr. Rodrigo Octavio Filho.

Capital.—Rs. 40,000 : 000 \$000 (forty thousand contos), divided into 400,000 shares of 100 \$000 each.

The objects of the Company are to exploit the contract made with the Government of Brazil for the erection of high-power stations for direct communication with Europe and the United States.

Compania Radiografica Internacional de Costa Rica

Incorporated.—

Head Office.—San Jose.

Directors.—Mr. Jose J. Carranza Volio, Mr. Ricardo Pacheco Lara, Mr. Arturo Volio Jimenez, Dr. Antonio A. Facio Ulloa, Mr. Nicolás Peña Cañas.

President.—Mr. Jose J. Carranza Volio.

Vice-President.—Mr. Ricardo Pacheco Lara.

Treasurer and Secretary.—Mr. Nicolas Peña Cañas.

Auditors.—Mr. Porfirio Gongora Umaña, Mr. Juan Gomez Alvarez, Mr. Oscar Montealegre Gutierrez.

Manager.—Mr. Jose J. Carranza Volio.

Deputy Manager.—Mr. Ricardo Pacheco Lara.

Capital.—\$10,000 (gold American), 100 Shares.

The Company was formed solely and exclusively for the exploitation of the concession relating to wireless communications which is the property of Messrs. José Josquin Carranza Volio and Ricardo Pacheco Lara, according to the contract made with the supreme Government on May 5th, 1921, and approved by decree No. 47 of July 25th, 1921.

Deutsche Betriebsgesellschaft für drahtlose Telegrafie (Debeg). m.b.H.

Incorporated.—January 14th, 1911.

Head Offices.—Hallesches Ufer 12/13, Berlin, S.W.11.

Directors.—Dr. A. Franke, Kommerzienrat Dr. P. Mamroth, Dr. Carl Schapira, Georg Graf von Arco, Karl Solff.

Managers.—H. I. Behner, Karl Liesfeld.

The Company installs and operates wireless stations of the Telefunken system on board of vessels of the merchant marine.

Accounts are made up to September 30th.

Eilvese Gesellschaft m.b.H.

Founded.—February 14th, 1921.

Head Offices.—Hallesches Ufer 12/13, Berlin, S.W.11.

Directors.—Hans Bielschowsky, Heinrich Schuhmacher,

Manager.—Dr. Creite.

Capital.—The original capital of 14,250,000 marks was increased in January, 1923, to 20,000,000 marks.

The Company was formed for the purpose of erecting and operating the high-power station at Eilvese, near Hannover.

Federal Telegraph Company

Incorporated.—In the State of California, in 1911.

Offices.—Hobart Building, San Francisco, California.

Factory.—Palo Alto, California.

Chairman of Board.—Rudolph Spieckels.

Directors.—R. P. Schwerin, Leon Bocqueraz, Alexander Hamilton, Robert Hays Smith and Horace L. Hill, Jr.

President.—Ellery W. Stone.

Vice-Presidents.—Leon Bocqueraz, Alexander Hamilton.

Secretary.—Augustus Taylor.

Treasurer.—J. E. Godcharles.

Capital.—\$3,500,000⁰⁰; 350,000 shares, par value each \$10⁰⁰.

The Company was formed for the operation of wireless telegraphy and the manufacture of the Federal Arc and other wireless sets.

Independent Wireless Telegraph Company, Inc.

Incorporated.—February 12th, 1919, in the State of Delaware, U.S.A.

Head Office.—35, Water Street, New York, U.S.A.

Factory.—Port Chester, New York, U.S.A.

Directors.—P. R. Mallory, C. J. Pannill, C. D. Mallory, Frank C. Munson, Fulton Cutting, J. B. Smull.

President.—P. R. Mallory.

Vice-President and General Manager.—C. J. Pannill.

Treasurer.—R. M. Ganung.

Capital and Dividends.—Close Corporation.

The Company was formed for the operation of wireless telegraphy and the manufacture of wireless telegraph apparatus.

“ Italo-Radio ” Societa Italiana per i Servizi Radioelettrici.

Incorporated.—July 19th, 1923.

Head Office.—Via S. Martino al Macao 4, Roma (21).

President.—Senatore Guglielmo Marconi.

Vice-President.—Conte Enrico San Martino di Valperga.

Chairman and Managing Director.—Comm. Ing. Pier Lorenzo Parisi.

Technical Counsellor. Prof. Giancarlo Vallauri; Technical Manager, Commander Federico Liebe; Traffic Manager, Commander Mario Cambi; Chief Engineer, Ing. Eraldo Guerreschi.

Capital Authorised and Issued.—60,000,000 lire, in shares of 500 lire.

The Company exploits the concession relating to wireless communications according to the contract made with the Italian Government on September 23rd, 1923. The Company owns the radio group of Pisa with the continental and transcontinental transmitters of Coltano and the receiving centre of Nodica, the radio group of Milan with the continental transmitter of Arese and receiving centre at Redecesio, and is constructing a new transcontinental and continental group near Rome.

The Company is interested in the following companies: Transradio Compagnia Radiotelegrafica Argentina; Radiotelegrafica Brasileira.

Kresl & Co.

Incorporated.—October, 1922.

Head Office.—Prague-Karlin, Palackého tr.28.

Directors.—Ing. B. Kresl.

Capital Authorised and Issued.—Kc. 1 million.

The Company was formed for the purpose of manufacture of wireless apparatus under the patents of Telefunken and Lieben Corporation.

Marconi International Marine Communication Company, Limited (The)

Incorporated.—April 25th, 1900.

Head Office.—Marconi House, Strand, London, W.C.2.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc. (Chairman), The Rt. Hon. F. G. Kellaway, P.C. (Deputy Chairman and Managing Director), Lt.-Col. A. Simpson, C.M.G., R.E. (retired) (Deputy Managing Director), Alfonso Marconi, Capt. H. Riall Sankey, C.B., C.B.E., R.E. (retired), Henry W. Allen, F.C.I.S., H. Morgan, S. F. St. J. Steadman, Sir Charles J. Stewart, K.B.E., Rt. Hon. Lord Herschell, G.C.V.O.

General Manager.—

Assistant General Manager.—F. S. Hayburn.

Secretary.—A. Ogle, M.C., A.C.I.S.

Service Manager.—J. Lewis.

Marine Superintendent.—Capt. C. V. Daly.

Contract Manager.—A. R. Harding.

Technical Manager.—Commander J. A. Slee, C.B.E., R.N.

Capital.—£1,500,000 in shares of £1 each, issued and fully paid £1,192,726. (The capital was increased in May, 1919, by 900,000 shares of £1 each, of which 600,000 were offered to existing shareholders pro rata at par.). 5½ per cent. First Mortgage debentures (bearer)—authorised £250,000, issued £125,000, outstanding £57,300. Secured (without trust deed) as a floating charge on the undertaking and all the property. Redeemable at par, July 1st, 1941. Interest payable, January 1st and July 1st.

Accounts and Dividends.—Accounts are made up to December 31st and usually submitted in June following. The accounts at December 31st, 1923, showed a profit for the year of £85,315, which, added to the £41,580 brought forward from 1922, gave a total of £126,895 available for dividend. After paying dividends amounting to £119,272 a balance of £7,623 was carried forward.

Dividends paid, 1910, 5 per cent.; 1911, 7 per cent.; 1912, 1913 and 1914, 10 per cent.; 1915, 12½ per cent.; 1916, 1917, 1918, 1919 and 1920, 15 per cent.; 1921, 10 per cent.; 1922, 12½ per cent.; 1923, 10 per cent.; 1924, 5 per cent. interim.

Last Bearer Coupon paid, No. 26.

This Company was formed for the purpose of working throughout the world, except in the United States of America, Hawaii, Chili, and colonies or dependencies of those States, an exclusive licence for all maritime (being mercantile or yachting) purposes granted by Marconi's Wireless Telegraph Company, Limited. The Company has transferred to Associated Companies its rights in Canada, Argentina, Uruguay, Australasia, and all European countries and their dependencies except the United Kingdom and Italy. This Company owns and operates the wireless telegraph apparatus on about 3,000 vessels of the mercantile marine.

Marconi Scientific Instrument Company, Limited (The)

Incorporated.—November 1st, 1919.

Registered Office and Works.—70 Dudden Hill Lane, N.W.10.

Directors.—C. T. Bazell (Chairman), Lt. Col. Adrian, F. H. S. Simpson, C.M.G., Henry Morgan

Secretary.—Victor M. Luks, A.C.I.S.

Capital.—Authorised £40,000 in 40,000 shares of £1 each.

The Company was formed to manufacture and sell amateur wireless telegraphic and telephonic apparatus under licence from Marconi's Wireless Telegraph Company, Ltd. Also to manufacture and market all classes of land-line and submarine cable apparatus.

Marconi Wireless Telegraph Company of Canada, Limited (The)

Head Office.—Marconi Building, 9-11-13, Saint Sacrament Street, Montreal, Canada.

President.—C. G. Greenshields, K.C.

Vice-Presidents.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., Robert Bickerdike, A. E. Dymont.

Directors.—Rt. Hon. F. G. Kellaway, P.C., G. M. Bosworth, H. W. Allen, F.C.I.S., Dr. Milton, L. Hersey.

General Manager.—H. M. Short.

Secretary.—John D. Lowrey.

Traffic Manager.—G. H. Pearson, Assoc.I.R.E. (New York).

Chief Engineer.—J. H. Thompson, B.Sc., A.M.I.R.E. (New York), A.M.I.E.E. (New York), A.M.I.C.E. (Canada).

Authorised Capital.—On September 18th, 1924, the capital was reduced from \$7,500,000 to \$3,000,000 by reducing par value of shares to \$1 each, and increased to \$7,500,000, such increase to consist of 4,500,000 new shares of \$1 each. At the time of going to Press an issue of shares on the basis of one new share for every two old shares held is taking place.

The Company has sole wireless rights under all Marconi and General Electric Company patents in the Dominions of Canada and Newfoundland. It is the only Company in Canada providing wireless service. It owns and operates the wireless equipment on over two hundred ships of the Canadian and Newfoundland Mercantile Marines, and also owns and operates the duplex, transatlantic, commercial wireless telegraph station at Glace Bay in Nova Scotia.

The Company operates under contract with the Canadian and Newfoundland Governments, about forty wireless stations in the Great Lakes, Gulf of St. Lawrence, and on the Atlantic Coast. It has branch offices in Vancouver, B.C., Toronto, Ont., St. John, N.B. (winter), and St. John's (Nfld.). It owns and operates schools of radiotelegraphy in Montreal, Toronto, and St. John's (Nfld.).

Marconiphone Company Limited (The)

Incorporated under name of The Poulsen Wireless Telegraph Company, Ltd., on May 28th, 1915. Name changed to above on December 29th, 1923.

Registered Office.—Marconi House, Strand, W.C.2.

Directors.—Lt. Col. A. Simpson, C.M.G., R.E. (ret'd.) (Chairman), C. T. Bazell (Managing Director), Henry Morgan, I. Shoenberg.

Capital.—Authorised capital, £450,000 in 450,000 shares of £1 each. Issued capital, 300,007 shares fully paid, and 149,993 shares 7s. 6d. paid.

The Company is a private one.

Marconi's Wireless Telegraph Company, Limited

Incorporated.—July 20th, 1897, as "Wireless Telegraph and Signal Co., Ltd."; name changed as above in March, 1900.

Head Office.—Marconi House, Strand, London, W.C.2.

Works.—Chelmsford, Essex.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc. (Chairman), Rt. Hon. F. G. Kellaway, P.C. (Deputy-Chairman and Managing Director), Lt.-Col. Adrian Simpson, C.M.G., R.E. (retired) (Deputy Managing Director), Captain H. Riall Sankey, C.B., C.B.E., R.E. (retired), Alfonso Marconi, Henry W. Allen, F.C.I.S., S. F. St. J. Steadman, Sir Charles J. Stewart, K.B.E., Rt. Hon. Lord Herschell, G.C.V.O., H. Morgan, and Major H. Lefroy, J.P.

Joint General Managers.—H. W. Allen, F.C.I.S., Andrew Gray, A.G.T.C., M.I.E.E., A.M.I.C.E.

Assistant General Managers.—G. E. Turnbull, H. W. Corby, F.C.I.S., and C. E. Rickard, O.B.E., M.I.E.E., M.I.M.E.

Secretary.—A. Ogle, M.C., A.C.I.S.

Engineer-in-Chief.—R. N. Vyvyan, M.I.E.E.

The Company was formed to acquire Senatore Marconi's patents for wireless telegraphy in all countries except Italy, its colonies and dependencies, and has since acquired a large number of other patents relating to wireless telegraphy, including those of Sir Oliver Lodge, the General Electric Company of New York (except for America), etc.

It has substantial interests in various subsidiary and affiliated Companies.

The Company conducts public wireless telegraph services, and messages are accepted for transmission, via Marconi, to the United States of America, Central and South America, Canada, Australia, New Zealand, the West Indies, British Guiana, British Honduras, Spain, France, Switzerland, Austria, etc.

Accounts and Dividends.—Accounts are made up to December 31st. The Company's accounts at December 31st, 1923, showed shares in Associated Companies, £2,346,574 and patents £352,941. General reserve account £1,650,746. The profit for the year, together with the balance brought forward, was £695,815 and, after payment of dividends, £403,308 was carried forward.

In respect of each of the years 1911, 1912 and 1913, the Company paid dividends of 17 per cent. on the Preference shares and 20 per cent. on the Ordinary shares; in respect of 1914 and 1915, 7 per cent. Preference and 10 per cent. Ordinary dividends were paid; in respect of 1916 the dividends were 12 per cent. on the Preference shares and 15 per cent. on the Ordinary shares; in respect of 1917 the dividends were 17 per cent. on Preference shares and 20 per cent. on the Ordinary shares. For 1918 dividends of 22 per cent. on the Preference shares and 25 per cent. on the Ordinary shares were paid. For 1919 dividends of 22 per cent. on the Preference shares and 25 per cent. on the Ordinary shares were paid, plus a bonus of 5s. per share on both Preference and Ordinary shares. For 1920, 1921 and 1922, dividends of 12 per cent. on the Preference shares and 15 per cent. on the Ordinary shares were paid. For 1923 dividends of 7 per cent. on the Preference shares and 10 per cent. on the Ordinary shares were paid. An interim dividend of 5 per cent. has been paid on the Ordinary shares for the year 1924 (coupon 26), and a dividend of 7 per cent. on the Preference shares has been paid (coupon 27).

Capital.—Authorised £4,000,000 in 3,750,000 Ordinary shares of £1 each, and 250,000 7 per cent. Cumulative Participating Preference shares of £1 each. Issued 2,750,065 Ordinary shares of £1 each, and 250,000 Preference shares of £1 each. The Preference shares are entitled to a cumulative dividend of 7 per cent., and, after the Ordinary shares have received a 10 per cent. non-cumulative dividend, to share *pari passu* with the latter shares in surplus profits remaining.

6½ per cent. Convertible Ten-Year First Debenture Stock. Authorised, £3,000,000. Issued, £1,500,000. Outstanding, £1,429,205. Secured as a first floating charge on all the Company's assets present and future, including uncalled capital (if any). Repayable on or before October 1st, 1932.

Stockholders have right to convert on any January 1st, April 1st, July 1st and October 1st, between April 1st, 1923, and April 1st, 1929, all or any part of their holding into ordinary shares on the basis of one fully paid share of £1 for each £3 of debenture stock.

Interest payable half-yearly on April 1st and October 1st.

Nederlandsche Seintoestellen Fabriek

Incorporated.—February 27th, 1918.

Head Office and Works.—Jan van der Heydenstraat—Hilversum—Holland.

Directors.—D. Hudig (President), J. Rypperda Wierdsma (vice-President), M. H. de Beaufort, A. E. J. Bertling, Prof. C. L. van der Bilt, A. J. M. Goudriaan, J. F. van Hengel, J. H. Hummel, A. F. Philips, P. J. Roosegaarde Bisschop, Bern E. Ruys, G. L. Tegelberg, A. Veder, A. Hubert, G. Marconi, G. Périer, M. Travailleur

Managers—L. H. F. Wackers and A. Dubois.

Capital.—1,957,700 florins, divided into 1,489 shares of 300 florins each and 1,511 shares of 1,000 florins each. The financial year ends December 31st.

The Company was formed for the purpose of exploiting a factory or factories for the manufacture of installations, apparatus and tools, destined for or relating to wireless telegraphy, telephony, signalling apparatus, etc., and trading in the above-mentioned apparatus. It has entered into an agreement with Marconi's Wireless Telegraph Co., Ltd., whereby the latter Company grants to the N.S.F. the exclusive right to manufacture and to sell in Holland and the Dutch Colonies wireless material according to its patents and designs, present and future.

Nederlandsche Telegraaf Maatschappij, "Radio-Holland"**Incorporated.**—December 6th, 1916.**Head Office.**—562 Keizersgracht, Amsterdam.**Directors.**—D. Hudig L. Jzn (President), J. Rypperda Wierdsma, A. J. M. Goudriaan, M. H. de Beaufort, G. L. Tregelberg, P. J. Roosegaarde Bisschop, Prof. C. L. van der Bilt, J. F. van Hengel, Bern E. Ruys, J. H. Hummel, A. F. Philips, A. E. J. Bertling, A. Voher, Senatore G. Marconi, Maurice Travailleux, Gaston Prier, G. E. Turnbull and A. Hubert.**Managing Directors.**—L. H. F. Wackers and Th. P. van den Bergh.**Administrator, Dutch East Indies.**—W. G. Kuyck.**Capital.**—3,000,000 florins, divided into 3,000 shares of 1,000 florins each, of which 2,000 shares have been issued and fully paid.

The financial year ends at December 31st. Dividend past year 5 per cent.

The Company was formed for the purpose of the establishment, sale, hire, control and exploitation of wireless telegraph and wireless telephone stations in Holland and its colonies.

Norsk Marconikompani Aktieselskap**Constituted.**—November 28th, 1918.**Head Offices.**—Drammensveien 42, Kristiania.**Branch Office.**—Nordenfjeldske's Bygning, Bergen.**Capital.**—1,250,000 Kroner, divided into 1,250 registered shares of Kroner 1,000 each.**Directors.**—Otto Thoresen (Kristiania), Commander J. Bull (Horten), K. Zimmer (Bergen), Louritz Kloster (Kristiania), G. E. Turnbull (London), E. S. Skottun (Kristiania).**Deputy Directors.**—A. Hubert (Bruxelles), J. Ringstad (Drammen).**Managing Director.**—E. S. Skottun.**Technical Manager.**—B. L. Gottwaldt.**Dividends.**—1919, 7 per cent.; 1920, 15 per cent.; 1921, 15 per cent.; 1922, nil; 1923, 6 per cent.

This Company was constituted for the manufacture, sale, and rental of apparatus for Wireless Telegraphy, Telephony, Signalling, etc., and other business in connection therewith. It has acquired the Marconi patent rights, present and future, for exploitation in Norway and on board ships flying the Norwegian flag.

Norsk Telefunken Radioaktieselskap**Incorporated.**—1919.**Address.**—Ovre Voldgate 11, Christiania. Lodin Leppsgate 2, Bergen.**Directors.**—Major Carsten Bruun, Herman Krag, K. Janicke.**Managing Director.**—Karl Holmvang.**Capital.**—Kroners 250,000.00.**Objects.**—Manufacturing and sale of wireless material. Dealers in connection herewith.**Radio-Austria Company, Limited****Incorporated.**—July 12th, 1923.**Offices.**—Renngasse 14, Vienna, I.**Directors.**—His Excellency Baron Carl Pitner (President), H. A. White (Vice-President), H. W. Allen, F.C.I.S., Colonel Franz Anderle, Commercial Councillor Robert Czerweny-Arland, Consul-General Richard Fanta, Ministerial Councillor Rudolf Heider, Friedrich von Kammann, Ernst Kraus, Hans von Mauthner, Ministerial Councillor Oestreicher, Colonel Adrian Simpson, Joseph Straffner.**Principal Officers.**—Managing Director, H. A. White. Manager and Engineer-in-Chief, Captain Franz Leist. Secretary, Hanns Aumann. Traffic Manager, Leopold Pack. Chief Accountant, Roland Hellmer. Engineers, Dr. L. Hoegelsberger, F. M. Benesch.**Capital Authorised.**—£133,000, in £1 shares.**Capital Issued.**—£133,000.

First business year ends on December 31st, 1924.

The Company was formed to operate the Concession granted on September 18th, 1922, to conduct wireless telegraph services between Austria and all other countries for a period of at least thirty years. The Company took over the Austrian Government's obsolete stations at Deutsch-Altenburg and Laaerberg and erected on their sites the latest types of Marconi stations equipped for high-speed automatic transmission and reception under "remote control" operated from the Company's central telegraph office in Vienna. At the end of 1924, wireless services were in operation with England, all countries of the British Empire and of North and South America, Russia, Rumania, Poland, Bulgaria, Yugo-Slavia and Germany.

Radio Communication Company, Limited**Incorporated.**—March 14th, 1919.**Head Office.**—34/35, Norfolk Street, London, W.C.2.**Directors.**—J. Herbert Scrutton, Capt. R. S. Hilton, Axel W. Berg, Brig.-Gen. R. Marr Johnson, C.M.G., D.S.O., B. Binyon, O.B.E. (Managing Director).**General Manager.**—R. Ferguson.**Secretary.**—W. H. C. Rowe, C.B.E.**Capital.**—£200,000, divided into 100,000 6 per cent. Cumulative Participating Preference shares and 100,000 Ordinary shares. Issued: 79,502 Ordinary and 86,650 Preference.

The Company was formed under the aegis of the Indo-European Telegraph Company, Limited, for the manufacture, sale and operation of radio apparatus, including "Polar" radio equipment for ships and land stations, together with every description of broadcasting supplies.

Radio Corporation of America

Incorporated.—October 17th, 1919, in the State of Delaware.

New York Office.—Woolworth Building, 233 Broadway, and at 66 Broad Street, New York City.

Directors.—Owen D. Young (Chairman), E. J. Nally, E. W. Rice, Jun., Hon. John W. Griggs (General Counsel), James R. Sheffield, A. G. Davis, Gordon Abbott, Edward W. Harden, George S. Davis, Guy E. Tripp, Edwin M. Herr, Arthur E. Braun, James G. Harbord, John Hays Hammond, Jun., Harry P. Davis, Gerard Swope.

President.—Major General James G. Harbord.

Managing Director of International Relations.—Edward J. Nally.

Vice-President and General Manager.—David Sarnoff.

Vice-President and General Attorney.—William Brown.

Secretary.—L. MacConnach.

Comptroller.—Charles J. Ross.

Treasurer.—George S. De Sousa.

Assistant Treasurer.—M. H. Payne.

Capital.—Authorised: \$25,000,000, "A" Preferred Stock in 500,000 shares of \$50 each. There are also 1,500,000 "A" Common shares of no par value. Rights: The "A" Preferred Stock is entitled to receive dividends of 7 per cent. per annum and no more. In any distribution of the assets it is entitled to be paid off at par, prior to any payment to the "A" Common shareholders. The "A" Preferred dividends are cumulative after the fiscal year ending in or with the calendar year 1923, and the "A" Preferred Stock may be retired on any day on which a dividend thereon shall be payable, at 110 per cent. of the par value plus accrued dividends.

(Dividend No. 1 was paid on original Preferred Stock (\$5 par value) on July 1st, 1924, viz., 3½ per cent. for first two quarters of 1924 to stockholders of record, June 6th, 1924.)

Original Common and Preferred Stock is now being exchanged for "A" Common and "A" Preferred Stock.

The Company was formed to acquire certain assets of The Marconi Wireless Telegraph Company of America and all wireless inventions, present and future, of the General Electric Company of New York.

"Radio Romana" Societate Anonima Romana pentru Industriasi Comertul Materialelor Telegrafice si Telefonice

Incorporated.—April 5th, 1920, under the name "Marconi S.A.R.," amalgamated with "Radi-Electrica," with effect from October 27th, 1921.

Head Office.—Strada Tudor Vladimirescu 12, Bucarest, Roumania.

Directors.—Prince Barbu Stirbey (President), C. Busila (Vice-President), C. Boerescu, E. Boxshall, L. Coroiu, E. Girardeau, E. Leonida, J. Sabattier, G. Tenot, N. Tigara-Samurcas, N. Vasilescu-Karpen.

Committee of Direction.—C. Boerescu, E. Boxshall, G. Tenot.

Manager.—Alex. Marius Gheorghiu.

Secretary.—A. A. O'Kelly.

Capital.—Lei 12,000,000 fully paid-up shares of 500 lei each.

The Company was formed for the manufacture, supply and installation of all kinds of telegraphic and telephonic apparatus, including wireless.

Radio Station Marconi Societe Anonyme, Berne

Incorporated.—February, 1922.

Head Office.—Hotel Principal des Postes, Berne, Switzerland.

Directors.—Dr. F. Truessel (President), Dr. Usteri (Vice President), Henry W. Allen, Dr. Furrer, Director-General of Swiss Telegraphs), M. Chapuisat, M. Frey, M. Schmidlin, Herbert A. White.

Manager.—Dr. F. Rothen.

Capital.—2,100,000 francs, divided into 4,200 shares of 500 francs each.

The Company has been granted a concession by the Swiss Government for the operation of a station at Berne and it conducts commercial wireless telegraph services with England and other European countries.

Financial Year.—Ends December 31st.

R.M. Radio Limited

Registered.—September 6th, 1919.

Head Office and Engineers' Offices and Show-rooms.—21, Garrick Street, Leicester Square, W.C.2

Directors.—H. R. Rivers-Moore, L. J. Graham, A. G. Ionides, C. N. Rivers-Moore.

Secretary.—R. C. W. Clarke.

Capital.—£20,000.

The Company was formed for the purpose of constructing, supplying, maintaining and operating radiotelegraphic and telephonic apparatus of all kinds for the purpose of intercommunication on land, at sea, and in the air.

Russian Company of Wireless Telegraphs and Telephones (The)

Incorporated.—October 8th, 1908.

Head Office.—14, Lopouchinskaja, Leningrad, Russia.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., S. M. Eisenstein, Pierre de Balinski, M. Salberg, Lt.-Col. Adrian Simpson, C.M.G., R.E. (Managing Director), Admiral I. F. Bostrom, I.R.N. (retired), L. M. Eisenstein (Deputy Director).

Secretary.—Leon Eisenstein.

Capital.—Originally 1,200,000 roubles in 12,000 shares of 100 roubles each. This capital was increased to 1,800,000 roubles in November, 1911, in order to enable the Company to acquire a licence from Marconi's Wireless Telegraph Company, Limited. The capital was further increased in 1913 to 2,400,000 roubles, and in 1914 to 3,000,000 roubles, divided into 30,000 shares of 100 roubles each.

The financial year ends December 31st (Russian date).

Dividends.—In respect of the years 1912 and 1913 dividends of 6 per cent. have been paid and 15 per cent. in respect of 1914 and 1915, and 17 per cent. for 1916.

The Company owns the Russian patents taken out in the name of S. M. Eisenstein, and also holds an exclusive licence to use and exploit the Marconi Company's patents in Russia (excluding stations for international communication or on vessels of Russian Mercantile Marine).

The works belonging to the Company were nationalised by decree of the Bolshevik Government in 1918, and since that time have been under Soviet control.

Siemens Brothers & Co., Ltd.

Incorporated.—December 28th, 1880.

Head Office.—Caxton House, Westminster, London, S.W.1. Commercial Offices: Woolwich, London, S.E.18.

Directors.—G. Mure Ritchie, (Chairman), Rt. Hon. Sir William Bull, Bart., M.P., General Sir Hubert de la Poer Gough, G.C.M.G., K.C.B., K.C.V.O., Right Hon. Lord Queenborough, Sir Walter Roper Lawrence, Bart., G.C.I.E., G.C.V.O., C.B., William Oliver Smith, Henry John Thomas, George Chauvin.

Managing Director.—George Chauvin.

Secretary.—Walter Wheeler, F.C.I.S.

General Manager.—Francis Hird, M.I.E.E.

Capital.—Authorised £2,500,000 in 1,500,000 ordinary shares of £1 each and 1,000,000 10 per cent. Cumulative Preference Shares of £1 each. Issued and fully paid 1,500,000 ordinary shares and 300,000 Preference Shares. 4½ per cent. Debenture Stock issued £1,000,000. Outstanding £877,300.

Manufacturers of, and dealers in, all classes of electrical cables. Telephone, telegraph, signalling and measuring apparatus. Wireless equipments, batteries, etc.

Societa Anonima Fiumana per le Radiocomunicazioni

Incorporated.—September 14th, 1921.

Head Office.—Piazza Regina Elena (Palazzo Adria), Fiume.

Chairman.—Senatore Guglielmo Marconi.

Managing Director.—Marquis Luigi Solari.

Directors.—Com. te Chiaffredo Paoletti, Comm. Ing. Carlo Conighi, Prof. Arturo de Meichsner, Sig. Idone Rudan, Sig. Guido Lado, Sig. Avv. Ernesto Franchi.

Censeurs.—Sig. Annibale Ploech, Sig. Basilio Marassi, Sig. Rodolfo Bertini.

Authorised Capital.—150,000 lire (completely issued).

The Company was formed for the erection of wireless stations (telegraphic and telephonic), and their exploitation for public, commercial and private service, and for communication between these stations and Rome, also with foreign naval or land stations.

Erection and exploitation in the Fiuman territory of direction finding stations.

Société Anonyme Internationale de Télégraphie Sans Fil

Incorporated.—March 31st, 1913.

Head Office.—13, Rue de Bréderode, Brussels.

Capital.—4,500,000 francs, divided into 9,000 shares of 500 francs each, all issued and fully paid.

The last dividend paid was 20 per cent. for the year 1923.

The financial year ends at December 31st.

The Company exploits wireless telegraphy on vessels of the mercantile marine of all European countries excepting the United Kingdom of Great Britain and Ireland, Germany, Austria-Hungary, Italy and France, and at the present time owns and operates wireless telegraph apparatus on over 600 vessels.

Société Belge Radio-Electrique, Société Anonyme.

Incorporated.—October 4th, 1922.

Head Office.—4, Rue d'Egmont, Brussels.

Directors.—M. Félicien Cattier (Président), MM. Henri Baron Lambert de Formanoir de la Cazerie, Léon Baron de Steenhaut de Waerbeek, Em. Girardeau, Baron Léon Greindl, Maurice Hulin, G. E. Turnbull, Gaston Perier, Maurice Travailleur, Henry Urban, Firmin Van Brée, Jacques Van Hoegaerden.

Managing Director.—Mr. Maurice Philippson.

Capital.—4,000,000 francs, divided into 8,000 shares of 500 francs each.

Société Française Radio-Electrique, Société Anonyme.

Incorporated.—April 4th, 1910.
Head Office.—79, Boulevard Haussmann, Paris.
Laboratory and Works.—Levallois-Perret (Seine), 2, Quai Michelet.
Big Machine Works.—Belfort: Société Alsacienne de Constructions Mécaniques.
Chairman.—M. Henri Bousquet.
Vice-Chairman.—M. G. Ferrand.
Financial Directeur.—M. A. Fondère.
Managing Director.—M. E. Girardeau.
Directors.—Comte de Beaumont, Baron de La Chevrelière, P. Desachy, A. Dupont, N. Pietri, O. de Rivaud.
Technical Manager.—Major P. Brenot.
Technical Advisers.—MM. Bethenod, Latour, Boucherot, de Bellescize.
Capital.—12,000,000 francs, divided into 120,000 shares of 100 francs each, all issued and paid up.
The Company manufactures wireless telegraph apparatus and engines, and erects wireless stations, and also owns and operates the patents of MM. J. Bethenod, E. Girardeau, M. Latour, etc.
It exploits chiefly that system of wireless telegraphy which employs high-frequency machines, the system adopted for all the great stations of France and its Colonies and by various other Governments.

Société Indépendante Belge de Télégraphie sans Fil Société Anonyme

Incorporated.—January 29th, 1920.
Head Office.—4 rue d'Egmont, Bruxelles.
Directors.—M. Henri Baron Lambert, President; MM. Van Hoegaerden, Baron de Steenhault de Waerbeek, Maurice Philippon, de Formanoir de la Cazerie, Van Halteren.
Manager.—Major Roland.
Capital.—1,000,000 Francs, divided into 2,000 shares of 500 francs each.

Société Indépendante de Télégraphie sans Fil

Head Office.—66, Rue la Boétie, Paris.
Works and Laboratory.—Malakoff 76 Route de Châtillon.
Administrators.—M. M. Boé (Président), F. Bézerie, Maurice E. Wormser.
Manager.—Mr. Lezard.
Director délégué.—E. Wormser.
Technical Advisers.—M. le Docteur L. Brillouin, Laüt, Poncet.
Capital.—1,500,000 francs, divided into 3,000 shares of 500 francs each, issued and fully paid.
The Company manufactures wireless telegraph and telephonic apparatus, including valves, and constructs and maintains wireless stations, both land and ship. The Company operates the patents of G. Beauvais, R. Braillard, L. Brillouin, R. B. Goldschmidt, P. J. Laüt, etc.

Societe Radiotechnique Polonaise (P.T.R.), Société Anonyme

Incorporated.—January 3rd, 1920.
Head Office.—22, rue Wilcza Warsaw.
Works.—Radio Works, 29, rue Narbutta; Mechanical Works, 3 rue Syrena, Warsaw.
Directors.—Henryk Korwin-Krukowski (Chairman), Henryk Schampanier, Henryk Kolberg, Col. A. Simpson, C.M.G., Emile Girardeau, Eugène Hannotiaux, Raymond Hubbard, Wadysaw Heller, Felician Karsnicki, Comte Henryk Potocki, Roman Rudniewski.
General Manager.—Henryk Kolberg.
Managers.—Felician Karsnicki (Deputy General Manager), Wadysaw Heller (Director of Radio Works), Leon Malecki (Director of Mechanical Works), Roman Rudniewski (Commercial Director), Alexis M. Cheftel (Technical Director).

The Company manufactures wireless telegraph and telephone apparatus, exploits the patents and licences relating thereto and is strongly interested in the development of Broadcasting in Poland.

Svenska Radioaktiebolaget.

Incorporated.—July 29th, 1921.
Head Office.—Alstromergatan 12, Stockholm, Sweden.
Directors.—Mr. Axel Lindblad, Mr. Gustaf Dalen, Mr. Oscar Falkman, Mr. Ivar Wibom, Mr. Gottlieb Piltz, Mr. Ulrich Salchow, Lieut. Col. Adrian Simpson, Mr. G. E. Turnbull.
Manager.—Captain I. Wibom.
Chief Engineer.—Dr. Mauritz Vos.
Capital.—Kr. 700,000 divided into 7,000 shares of Kr. 100 each.

Telefunken Gesellschaft für Drahtlose Telegraphie m.b.H.

Incorporated.—June 15th, 1903.
Head Office.—Hallesches Ufer 12/13, Berlin, S.W.11.
Directors.—Dr. Ing. e.h. Count von Arco, Dr. Ing. C. Schapira, Fritz Ulfers, Hans Bielschowsky.
Founded by the Allgemeine Elektrizitäts-Gesellschaft, Berlin, and Siemens and Halske A.G., Berlin, who hold all the shares.

Transradio A.G. für Drahtloser Übersee-Verkehr

Founded.—1918.

Head Office.—Berlin S.W.11, Hallesches Ufer 12/13.

Founded by the Allgemeine Elektrizitäts-Gesellschaft, Siemens & Halske A.-G. and Telefunken Gesellschaft für drahtlose Telegraphie m.b.H. Berlin. The Company was formed to exploit installations for wireless telegraphy and telephony in Germany and other countries.

Board of Directors.—Dr. Ing. P. Mamroth, Dr. Franke, Dr. George Graf v. Arco, Direktor Schhitter, Geh. Oberfinanzrat W. Müller, Dr. C. Schapira.

Managing Directors.—F. Ulfers, E. Rotscheidt, H. Bielschowsky, E. Quäck.

The Company which operates the high power stations of Nauen and Eilvese (Hanover) maintains a direct wireless telegraph service with North- and South-America, Egypt, Russia, Italy, Spain, Moukden, etc.

Transradio Internacional Compania Radiotelegrafica Argentina

Founded.—December 14th, 1920.

Head Office.—San Martin 329, Buenos Aires.

Directors.—Ing. Eduardo Huergo (President), Sr. Entilio Albert (Vice-President), Commander Lloyd Hirst (Secretary), Messrs. R. J. Schmidt, C. H. Nance, H. Pincemin, G. W. Hayes, R. W. Roberts, C. M. Pellegrini, L. Nicol.

Deputy Directors.—R. Geissmann, W. A. Reece, A. Blum, J. M. Paez.

Manager.—Sr. C. R. kauf.

Auditor.—Dr. E. Restelli.

Assistant Auditor.—Sr. E. R. Sommer.

Capital.—Authorised 14,000,000 pesos, issued 11,000,000 pesos.

The Company was formed to erect wireless stations and to exploit wireless services. Their high-power station at Monte Grande has been in operation since January, 1924, and communicates with Rocky Point, U.S.A.; Ste. Assise, France; and Nauen, Germany.

Tropical Radio Telegraph Company

Incorporated.—June 2nd, 1913, Delaware.

Head Office.—131, State Street, Boston, Mass.

Directors.—John S. Bartlett, Victor M. Cutter, Crawford H. Ellis, W. Cameron Forbes, Reginald Foster, Francis R. Hart, Robert F. Herrick, George C. Lee, William Newsome, Bradley W. Palmer, Andrew W. Preston, William S. Spaulding, Daniel G. Wing.

President.—Andrew W. Preston.

General Manager.—George S. Davis.

Secretary.—Arthur E. Nicholson.

Treasurer.—Cecil B. Taylor.

Chief Engineer.—William E. Beakes.

The fiscal year ends December 31st of each year.

The Company operates a system of radio communication between the United States and the various countries of Central America.

Western Electric Co., Ltd.

Incorporated.—January 10th, 1910.

Office.—Connaught House, 63, Aldwych, W.C.2.

Directors.—J. E. Kingsbury, F. H. Wilkins, H. M. Pease, F. Gill, G. H. Nash, Col. N. Harrison, C.M.G., D.S.O.

Managing Director.—H. M. Pease.

Secretary.—R. L. Diemer.

Capital.—One million pounds, authorised capital.

This is a private limited company, and does not publish reports.

The Company manufactures telephone apparatus and cable, and radio apparatus.

Wireless Specialty Apparatus Company

Incorporated.—June 14th, 1907, New York, N.Y.

Head Office.—131 State Street, Boston, Mass.

Directors.—George S. Davis, William Newsome, Victor M. Cutter, C. B. Davis, John W. Elwood, T. S. Knight, J. A. Dalzell.

President.—George S. Davis.

Vice-President.—William Newsome.

Secretary and General Counsel.—John L. Warren.

Treasurer.—E. C. Porter.

Chief Engineer.—John A. Proctor.

Consulting Engineer.—Professor Greenleaf Whittier Pickard.

Capital.—\$492,000.

The fiscal year ends December 31st of each year.

The Company is engaged in the development and manufacture of radio apparatus and devices and of "Faradon" condensers for both high and low tension work, including condensers of special design for continuous wave and carrier current apparatus.

BIOGRAPHICAL NOTICES

It is regretted that lack of space compels us to omit several names, well known in connection with Wireless, which have appeared in previous editions of the YEAR BOOK, to make way for others selected from the ever-increasing number of those taking an active part in this branch of Electrical Science.

Abraham, Henri.—B. 1868. Professor of Physics in the University of Paris. President of the Société Française de Physique and of the Société Française des Electriciens. General Secretary of the International Union of Physics.

Alexanderson, Ernst Frederik Werner.—B. Upsala, Sweden, 1878. Educ. at the University of Lund, at the Royal Institute of Technology, Stockholm, and at Berlin. Entered the service of the C. and O. Electric Company, 1901. Joined the General Electric Company, 1902, later becoming Consulting Engineer to the latter concern. Chief Engineer, Radio Corporation of America, 1920. Fellow and Past President of the Institute of Radio Engineers. Originated and developed the transmitting system used extensively comprising the Alexanderson alternator, magnetic amplifier, and multiple-tuned antenna. Developed the "Barrage" receiver and other kindred inventions. Address: 66, Broad Street, New York.

Appleby, Thomas.—B. 1886, near Newcastle-on-Tyne, England. Arrived in America, 1888. Went to sea, 1909, as radio operator. September, 1909, in charge of United Wireless Station at Atlantic City, N.J. 1912, in charge of Wanamaker-Marconi Service between New York and Philadelphia Wanamaker Stores. 1917, commissioned in the U.S. Navy as a Lieutenant (J.G.) for Radio Engineering. Spring of 1918, established shore radio compass stations for the detection and location of enemy vessels in West Atlantic. 1919, Radio Engineer in the Office of the Director of Naval Communications. Resigned from Navy Department and entered profession of Patent Lawyer, M.I.R.E. (Amer.). 1924, Elected President, Executive Radio Council, Third (U.S.) District. Address: 5847 Ellsworth Street, Philadelphia, Pa., U.S.A.

Appleton, Edward Victor, M.A. (Cantab.), D.Sc. (Lond.).—B. Bradford, 1892. Educ. St. John's College, Cambridge. First-class Honours in Natural Science Tripos, Parts I and II (Physics). Served European War, 1914-1919, as Captain W/T, R.E. Specially interested in Thermionic Valves and Atmospheric. Wheatstone Professor of Physics, King's College, London. Late Lecturer at the Cavendish Laboratory, Cambridge. Original papers on Valves and Atmospheric in *Philosophical Magazine Radio Review* and *Proc. Royal Society*. Member of Thermionic Valve and Atmospheric Sub-Committee, Radio Research Board, Department of Scientific and Industrial Research. Fellow of St. John's College, Cambridge. Address: St. John's College, Cambridge, and King's College, London.

Arco, Graf Georg von.—B. Grossgorschtz, Schlesien. Educ. at Berlin University and Technical High School, Charlottenburg. 1898, Assistant to the late Professor Slaby in the department of wireless telegraphy. 1915, Doctor, University, Strassbourg. 1915, joined the Allgemeine Elektrizitäts Gesellschaft, Berlin. Manager of the Gesellschaft für Drahtlose

Telegraphie, 1903. Carried out practical wireless telephony over a distance of 35 km. 1906. Address: Tempelhof, Berlin, Albrechtstrasse, 49/50.

Asano, Dr. Osuke.—B. 1859. Graduated at the Tokyo Imperial University, 1881. Honorary Professor, Tokyo University. Director of The Electrotechnical Laboratory of the Department of Communications, 1897. Retired 1919. Japanese delegate to the International Conference on Electrical Units and Standards, London, 1908. Responsible for the so-called "Telshinsho" wireless system.

Athanasiadis, Rear Admiral Constantin, H.R.N.R. B. Athens, 1878. Educ. Royal Naval College, 1892-96. Commissioned in the Navy, 1896, and after eleven years' active service became interested in wireless telegraphy. Supervised the erection of the first wireless installations in Greece. Sent to London, 1909, by his Government as the head of a mission for the construction of Greek wireless stations. On his return to Greece he was appointed head of the Radiotelegraph Service of the Navy. In 1920 he resigned his commission in the Royal Navy, and in 1921 became sole agent for Greece of Marconi's Wireless Telegraph Co., Ltd., and of the Société Anonyme Internationale de T.S.F. Address: Athenian Club; Nikis St. 45, and Adrianou St. 14.

Austin, Louis Winslow, Ph.D., D.Sc.—B. 1867. Educ. Middlebury College, Clark University, and the University of Strasburg. Assistant Professor of Physics at the University of Wisconsin, then joined the staff of the Physikalisch-Technische Reichsanstalt, Berlin. Specially interested in quantitative high-frequency measurements. Head of the U.S. Naval Radiotelegraphic Laboratory, Washington, D.C., since 1908. President I.R.E., 1914; Vice-President of the International Union for Scientific Radiotelegraphy. Address: Radio Building, Bureau of Standards, Washington, D.C.

Bardeloni, Colonel C.—B. in Brescia, 1871. Educ. at Milan Polytechnic and Turin Polytechnic. Organiser of the first wireless telephone experiments in the Italian Army and of radiotelegraphy for airships (1910). At present Director of the Army Wireless Telegraph Services. Member of the London International Wireless Telegraph Conference, 1912; of the International Time Signals Conference in Paris, 1913, and of the International Radiotechnic Committee in Paris, 1921.

Beggerow, Dr. Hans.—B. 1874. Educ. University of Berlin and Freiburg-in-Breisgau. Chief adviser on Wireless Telegraphy to the German Admiralty from 1901 to 1919. Now occupied only with private scientific work. Address: Berlin, W. 15, Meierottstr. 3.

Bellini, Dr. Ettore.—B. Foligno, Italy, 1876. Educ. Naples University. Electrical Engineer to the Italian Navy, 1901. Chief of the Naval Electrical Laboratory at Venice, 1906. Carried

out extensive research work in connection with Wireless Telegraphy on warships and submarines. Joint inventor with Capt. Tosi, of the radiogoniometer.

Bethenod, J. F. J.—B. Lyons, 1883. Educ. Central School, Lyons. For a number of years assistant to Professor M. A. Blondel. On taking up his term of military service became associated with General Ferrié, and carried out a number of researches in connection with radiotelegraphy. In 1907 became editor of *La Lumière Electrique*. Founded, with M. E. Girardeau, the Société Français Radio Electrique, of which he is the Chief Engineer. Has published a large number of papers and articles on theoretical aspects of radio-telegraphy, which gained in 1921 the Hughes prize of the Academy of Science, Paris. Chevalier of the Légion d'Honneur. Member of the Société Française des Electriciens, of the American Institute of Electrical Engineers, and the Institute of Radio Engineers. Address: 15 Rue Michel-Ange, Paris.

Binyon, Major Basil, O.B.E., M.A., A.M.I.E.E.—B. Ipswich, 1885. Educ. Leighton Park, Reading; Trinity College, Cambridge. Natural Science Tripos, 1907, and post graduate course Electrical Engineering. Appointed engineer to Cie. Generale Radiotelegraphique of Paris, 1911. Appointed General Manager Anglo-French Wireless Co. Granted commission in R.N.A.S., 1914. Appointed Officer-in-Charge Wireless Experimental Department of R.N.A.S., 1916. Promoted Squadron Commander, 1917. Awarded O.B.E. (military), 1918. Appointed Major R.A.F., M.I.R.E. Managing Director Radio Communication Company, Ltd. Director of C. F. Elwell, Ltd., Mullard Radio Valve Co. Vice-President, Radio Society of Great Britain. Address: 34 Norfolk Street, Strand, W.C.2; "Hawthorndene," Hayes, Kent.

Blandy, Col. Lyster Fettiplace, C.B., D.S.O., R.E.—B. 1874. Educ. Haileybury College and Royal Military Academy, Woolwich. Entered Royal Engineers, 1895. Lieut.-Col., R.E., 1921. From 1908-12 Inspector Royal Engineers Stores at Woolwich. In the beginning of 1913 commanded the Wireless Signal Company at Aldershot. From 1914-17 in charge of Wireless Communication of the B.E.F., France. Became Chief Experimental Officer of Army Signals Experimental Establishment, 1917. Chief Experimental Officer, R.A.F., 1918, and thence transferred Controller of Communications of the Air Ministry; Head of the British Delegation to the International Technical Committee on Radio-Communication, Paris, 1921; Officer of the Legion of Honour; Chevalier of the Order of the Crown of Belgium; Mons Star with bar. Address: Naval and Military Club, London.

Blondel, André E.—B. Chaumont, France, 1863. Graduated at Paris University. Contributor to learned societies and technical journals on several subjects, including wireless telegraphy. Invented (1893) a new apparatus, which is known as the "Oscillograph," and which opened a fresh field for the study of alternating currents. Was the first to explain mathematically (1893), the effect of inertia in the shunting of alternators. Among his other activities in wireless telegraph, mention should be made of directed waves produced by a double aerial oscillating on the fifth harmonic, and also of a system of acoustically syntonized wireless telegraphy.

Blondlot, Professor Prosper René.—B. Nancy, 1849. After completing his scientific studies

in Paris, returned to Nancy. Became Professor at the Faculty of Sciences. Now Hon. Professor and Correspondent of the Institute of France. Devoted considerable study to the problem of electromagnetic waves, the main object of his researches being to determine the speed of propagation of such waves. In 1891 he found for this speed the value 302,200 km. per second, and, in 1893, by another and quite different method, the value 297,200 km. per second. Has also investigated the laws of propagation of wireless waves in various media.

Bouthillon, Léon.—B. 1884. Educ. Ecole Polytechnique; the Ecole Supérieure d'Electricité de Paris and the Ecole Supérieure des Postes et Télégraphes. Engineer of Posts and Telegraphs in 1908. In 1911 was nominated Director of Service de T.S.F. de l'Administration des Postes et Télégraphes. Represented France as delegate at the radiotelegraphic conference in London, 1912. In 1920 was nominated Engineer-in-Chief of Posts and Telegraphs. Left the administration of Posts and Telegraphs for private industry. Was General Inspector of Exploitations of La Compagnie Générale de T.S.F. of the affiliated companies and associations. Was Prof. of T.S.F. à l'Ecole Professionnelle Supérieure des Postes et Télégraphes. Has been Instructor of Physics at l'Ecole Polytechnique in Paris since 1913. Member of the Société Française de Electriciens; the Société Française de Physique; the Société de amis de la T.S.F.; Fellow of the Institute of Radio Engineers; membre du Comité National Français de Télégraphies sans fil Scientifique. He has written, in collaboration with G. E. Petit, a work entitled "La Télégraphie sans Fil." He is also the author of an important treatise in 8 volumes entitled "La Theorie et la Pratique des Radiocommunications." Address: 25, Rue Boissonade, Paris.

Bradfield, William Walter, C.B.E.—B. London, 1879. Entered the Wireless Telegraph & Signal Co., Ltd., 1897. Electrical assistant to Senator Marconi all through the course of the latter's experimental work in Radiotelegraphy on Salisbury Plain during 1897. Installed the first wireless apparatus on British battleships, 1899, and later conducted demonstrations to the United States and French Governments. Chief Engineer to the Marconi Wireless Telegraph Co. of America, 1902. Deputy Manager of Marconi's Wireless Telegraph Company, and of the Marconi International Marine Communication Co., Ltd. Manager of both concerns, 1910. Elected to the Board of the two companies, 1917. Joint General Manager Marconi's Wireless Telegraph Company, Ltd., and Marconi International Marine Communication Company, Ltd. Address: 1, St. James's Place, London S.W.

Brallard, Raymond.—B. 1888, Dept. of Jura, France. Studied engineering at the Ecole des Arts et Métiers, Cluny, and Ecole Supérieure d'Electricité, Paris, 1907. Two years in the electrical industry. Military service at the Eiffel Tower Wireless Station, 1910. Engineer of the Société Française Radio-Electrique, 1911. Visited Belgian Congo as Chief Engineer of Wireless Telegraphy and installed the network of Congoese Station, 1911-12. Installed the station at Laeken, near Brussels. Secretary of the International Commission on Scientific Wireless Telegraphy, 1913-14. During the war attached first to the Wireless Service of the Belgian Army, then to the Wireless Station at Croix d'Hins (Bordeaux). Technical manager of the Société Indépendante de T.S.F., 1919. Author of several scientific papers, Chief Engineer of the Société Belge

Radio-Électrique, and Consulting Engineer of the Belgian Congo Wireless Service. Address: 4, Rue d'Egmont, Bruxelles.

Branly, Edouard.—B. Amiens, 1844. Educ. St. Quentin College and Henry IV College, Paris. Fellow of the University, Doctor of Physical Science, and Doctor of Medicine. Some of his patents of 1890 and 1891 relate to the electrical conductivity of radio-conductors and to the operation of a local relay circuit from a distance. Officer of the Legion of Honour in recognition of the part he had played in connection with the discovery of "Wireless Telegraphy." Has constructed various independent distributing apparatus for producing telemechanical effects without wires. Elected a member of the Academy of Science, Paris, January, 1911. Address: 21, Avenue de Tourville, Paris 7e.

Bredow, Hans, Doctor.—B. 1879. Entered the service of the Telefunken Co., as an engineer in 1904, and took over the management jointly with Count Arco in 1908. In 1919 he entered the service of the State, later becoming Secretary of State directing the Telegraph, Telephone and Wireless service of Germany.

Brenot, Paul. Born Ruoms Ardèche, 1880. Educ. Ecole Polytechnique. Transferred to the Central Establishment of Radiotelegraphy. French delegate at the International Conferences of 1912, 1913, 1914, for Wireless, Time, Safety of Life at Sea. Carried through some important experiments on the employment of wireless telegraphy on aircraft 1910-11, which gained him the Cross of the Légion d'Honneur. During the war, whilst remaining in charge of French Colonial Wireless, appointed head of the Radioelectric Centre at Paris and of the Eiffel Tower Station. Left Army 1919. Became Manager of the Société Française Radioélectrique and of the Compagnie Générale de Télégraphie sans Fil. Address: Cie Générale de TSF, 79 Bvd. Haussmann, Paris (8e).

Bright, Sir Charles, F.R.S.E., M.Inst. C.E.—M.I.E.E., F.Inst.R.E. Educ. Lancing College and King's College. Engineer and Electrician for the construction, testing, laying and repairing of over 25,000 miles of submarine cable. Consulting Engineer. Gave special expert evidence before Inter-Departmental Cable Communication Committee (1902), House of Commons Radiotelegraphic Committee (1907), and Dominions Royal Commission (1911). Member of R.F.C. (Air) Enquiry Committee (1916). Official delegate at Air Conferences (1920, 1922 and 1923). Contributed papers, addresses and lectures to numerous learned societies, technical journals and reviews. Represented Australia as sole delegate at the International Radio-Telegraphic Conference (1912). Vice-President, Radio Society of Great Britain and Institute of Aeronautical Engineers. Addresses: Hatfield Heath, Essex, 25 Victoria Street, S.W., and Athenaeum Club, Pall Mall, S.W.1.

Brillouin, Leon. B. 1889, Docteur-ès-Science, Sous-directeur du laboratoire de Physique du Collège de France. Ingénieur Conseil à la Sté Indépendante de T.S.F. Address—30 Quai du Louvre, Paris I.

Brown, Sidney George, F.R.S., M.I.E.E.—B. 1873, Chicago, U.S.A., of English parents. Educ. Harrogate and London University. Inventor and engineer. Made a special study of submarine telegraphy and is inventor of the magnifying cable relay. Invented the drum cable relay and the magnetic shunt, 1898. In conjunction with the late Sir Henry Hozier

discovered the first practical methods of directional Hertz waves 1899. Since that date he has also devoted much attention to telephony and wireless telegraphy. Invented microphone amplifier, loud speakers, telephone receivers, Frenophone, etc. for wireless, and the gyroscopic compass for use of board ship. Vice-President of the Radio Society of Great Britain. Clubs: Athenæum, Royal Automobile. Address: 52, Kensington Park Road, W.11.

Bucher, Elmer E.—B. Akron, Ohio, 1885. Joined De Forest Wireless Telegraph Company as experimental engineer, 1903. Constructed several high power radio stations in Middle West and on the Gulf Coast. Joined the United Wireless Telegraph Company as construction and experimental engineer, 1904. Installed a number of ship stations for United States Government. Organized the United Wireless Telegraph Company's Instruction School, 1909. Joined the Marconi Wireless Telegraph Company as instructing engineer, 1912. Organized Marconi Institute, 1917, and acted in capacity of director. Transferred to Commercial Department, Radio Corporation of America, 1920, and appointed Commercial Engineer. Held position as Technical Editor of "Wireless Age" during the period 1913 to 1918. Author of "Practical Wireless Telegraphy," "Vacuum Tubes in Wireless Communication," "Wireless Experimenters' Manual" and other works. Appointed Manager of the Sales Department, Radio Corporation of America, 1922. Member of Institute of Radio Engineers.

Bullard, Rear-Admiral W. H. G., U.S. Navy.—B. 1866, Pennsylvania, U.S.A. Graduated, U.S. Naval Academy, 1886. Served on ships of the Navy and on shore, with particular reference to the science of Electrical Engineering, in which he had specialised. First Superintendent of the Naval Radio Service, 1912-16. Delegate of the United States at the International Conference for Safety of Life at Sea, London, 1913. During the war his sea service was in the Sixth Battle Squadron of the British Grand Fleet, serving in the North Sea. Member Allied Commission to receive surrender Austro-Hungarian Fleet and to determine status of Fiume. Awarded D.S.M. by U.S. Navy and made Commander of Legion of Honour (France). Given decoration by Poland in recognition of wireless work. After the war he returned to Washington in charge of the Communication Service of the Navy Department, with the title "Director Naval Communications." Author of the "Naval Electrician's Text Book" and other publications. Clubs: Officers Club, U.S. Naval Academy; Army and Navy Club, Washington, D.C.; Army and Navy Club of America, etc., etc. Racquet Club, Washington, D.C., New York Yacht Club, etc., etc.

Burrows, Arthur Richard, F.J.I., Assistant Controller and Director of Programmes, British Broadcasting Company, B. Oxford, 1882. Educ. City Science and Technical Schools and privately. Migrated from scholastic career (science master) to journalism, and after eight years' provincial editorial training joined editorial staff of *The Standard*; as news editor of Wireless Press supervised during war (under direction of Naval Intelligence Department) the editing and distribution of enemy wireless propaganda. Organised and directed transoceanic telephony experiments on C.P.O.S. "Victorian," July, 1920; edited the first wireless newspapers (*North Atlantic Times*) to be produced at sea twice daily. Addressed Second Imperial Press Conference, Parliament House, Ottawa,

August, 1920, on "Wireless in Relation to News Gathering"; organised and directed the several international wireless services from Geneva during the First and Second Assemblies of the League of Nations, November-December, 1920, September, 1921; directed earliest broadcast programmes from 2 LO, summer and autumn of 1922. Publications: "The Story of Broadcasting" (1924), and numerous articles for British and foreign magazines and newspapers. Address: 54 Chartfield Avenue, Putney, S.W.15. Club: Reform.

Burstyn, Dr. W.—B. Austria, 1877. Educ. Vienna University. Started his career as electrical engineer with the Schuckert-Werke, Nürnberg. Later engineer with the Siemens-Schuckert-Werke, Charlottenberg; with the Gesellschaft "Telefunken," and others. Wireless engineer with the Russian Navy in the Russo-Japan war, later in Turkey. Developed together with Baron Lepel (1907-12) the quenched spark system. Was Chief Engineer with the A.E.G. until June last. Many publications, especially regarding wireless and electric switching, in "Jahrbuch für drahtl. Tel.," and other papers. Now proprietor of a Techno-Physical Laboratory, consulting engineer, and President of the "Association of Radio-Industry." Address: Berlin—Wilmsdorf Prinzregentenstrasse, 23.

Castañón, Lieut.-Col. Don Luis. Spanish Royal Engineers.—B. 1867. 1st Chief of Field Wireless Battalion. One of the pioneers of Wireless Telegraphy in the Spanish Army. From 1904 until 1919 in charge of Wireless affairs at the Centro Electrotécnico y de Comunicaciones de Madrid. Took part in the Mindanao, Luzon (Philippine Islands) and Spanish-American campaigns, and was seriously wounded in action.

Chaffee, Professor E. L.—B. 1885, Somerville, Mass. Educ. High School, Somerville, and Massachusetts Institute of Technology in Boston. Graduated B.S. in Electrical Engineering, 1907. Awarded the degree of M.A. in Physics, Harvard University, 1908, and Ph.D., 1911. Conducted courses in physics and radiotelegraphy at Harvard University. Engaged in research and consultation work in radiotelegraphy, Associate Professor of Physics, Harvard University. Author of several publications. Fellow Academy of Arts and Sciences (Amer.), Fellow I.R.E. (Amer.), Member Physical Soc. (Amer.), Member Optical Sec. (Amer.). Address: Cruft H. T., Elect. Laboratory, Harvard University, Cambridge, Mass.

Chamberlain, Eugene Tyler.—B. Albany, N.Y., 1856. Educ. Albany Academy and Harvard College. Graduated 1878. In business for two years, then took up journalism and acted as legislative and political correspondent to the Associated Press. Appointed Commissioner of Navigation (1893-1921). Prominent advocate of wireless telegraphy as a means of promoting safety of life on merchant vessels at sea, and has since assisted in promoting legislation on this subject. Delegate for the U.S.A. to the Convention on Safety of Life at Sea, at London, 1914. Address: Department of Commerce, Bureau Foreign and Domestic Commerce, Washington, D.C.

Chree, Charles, F.R.S.—B. 1860, Lintrathen, Forfarshire, Sc.D. of Cambridge, Hon. LL.D. (Aberdeen). Graduated M.A. Aberdeen, 1879. Ex-President of Physical Society of London and of Royal Meteorological Society. Pres. Section of Terrestrial Magnetism and Electricity,

International Union of Geodesy and Geophysics. Obtained Watt Medal of Institution of Civil Engineers, and Hughes Medal of Royal Society. Largely concerned with geophysics, especially terrestrial magnetism and atmospheric electricity. Address: 75 Church Road, Richmond, Surrey.

Coursey, Philip R., B.Sc. (Eng.)—B. 1892. Educ. University College, London. Awarded Diploma in Electrical Engineering with Distinction. Graduated with first-class Honours in Electrical Engineering at the University of London. Subsequently acted as Assistant to Dr. J. A. Fleming, F.R.S., at University College, London. From 1915-18 served as Inspector of Wireless Telegraph Apparatus for the Admiralty; afterwards appointed to the staff of H.M. Signal School, Portsmouth, as Research Physicist. Sometime Research Electrical Engineer to the Dubilier Condenser Co., Ltd, now Chief Engineer to the Dubilier Condenser Co. (1921), Ltd. Author of many papers on Radiotelegraphy and Telephony, read before a number of Societies, and of "Telephony without Wires," and of "The Radio Experimenter's Handbook" (Parts I and II), "The Wireless Telephone—What it is and How it Works," "How to Build Amateur Valve Stations," etc. Associate Member of the Institution of Electrical Engineers, Member of the Royal Institution of Great Britain. Member, Hon. Secretary and Member of Committee of the Radio Society of Great Britain. Address: Stamford House, Marchmont Road, Richmond, Surrey.

Craven, Tunis A. M.—B. 1893. Lieutenant, U.S. Navy (Radio Traffic Engineer). Graduated U.S. Naval Academy, Class 1913. Radio Officer, U.S.S. "Delaware," 1913-1915. Fleet Radio Officer, U.S. Asiatic Fleet, 1915-1917. In charge U.S. Naval Coastal and Transoceanic Radio Operations, 1917-1920. U.S. Naval Representative at Provisional Inter-Allied Communication Conference at Paris, France, in 1919. U.S. Naval Radio Technical Advisor at International Conference on Electrical Communications at Washington, 1920. Was also Acting Chairman of Sub-Committee on Wavelength Allocation at this Conference. U.S. Naval Representative at Conference of Technical Committee on International Radio Communication at Paris, France, in 1921. Fleet Radio Officer, United States Fleet, 1922-1923. Radio Division, Bureau of Engineering, U.S. Navy Department, September, 1923. Clubs: Army and Navy, Ends of the Earth, U.S. Naval, Institute.

Crawley, Lt.-Col. C.G.G. R.M.A., (ret.) M.I.E.E.—B. 1880. Educ. Dublin University and R.N. College, Greenwich. Employed at Wireless Telegraphy in the Navy, 1903 to 1913, as Experimental, Instructional, and Fleet Wireless Officer. Deputy Inspector of Wireless Telegraphy in the Post Office, 1913. Returned to the Naval Wireless service for the period of the war. Served in the Grand Fleet, in command of the R.N.V.R. Wireless School, at the Admiralty, and supervised the erection and working of various Naval stations abroad. Officer of Orders of Aviz and Liakat. Resumed his duties in the Post Office in 1919. Address: General Post Office, London, E.C.

De Forest, Dr. Lee.—B. Council Bluffs, Iowa. 1873. Graduated Ph.D. 1899. Founded the De Forest Wireless Telegraph Co., 1902, the Radio Telephone Co., and the De Forest Radio Telephone Co., 1907. As the outcome of experiments on high frequency radio currents, he

evolved the audion by inserting a grid in the two-electrode valve. M.I.E.E. (Amer.), Member of the Franklin Institute, M.I.R.E. (Amer.). Address: The De Forest Radio Telephone and Telegraph Co., Central Avenue, Jersey City, N.J.

Dellinger, J. H.—B. Cleveland, Ohio, 1886. Educ. East High School, Cleveland, Ohio, graduated 1903; Western Reserve University, Cleveland, Ohio; student 1903-07; George Washington University, Washington, D.C.; A.B. 1908. Princeton University; Fellow, 1912-13. Ph.D., 1913. Chief of Radio Laboratory, Bureau of Standards. Physicist in Bureau of Standards since 1907 to present time. Research on: electrical properties of copper (becoming the basis of international standard); miscellaneous mathematical and electrical subjects; electric units; science and development of radio communication. Author of three books on radio communication and numerous articles and treatises. Delegate of Department of Commerce at 1921 Conference in Paris of Inter-Allied Technical Committee on Radio Communication. Member of Technical Staff of Conference on Limitation of Armament and Far Eastern Problems, Washington, 1921-1922. Fellow of Institute of Radio Engineers; Fellow of American Physical Society; Washington Academy of Sciences; American Radio League Technical Advisory Committee; American Geophysical Union; American Section of the International Union of Scientific Radio Telegraphy. Address: Bureau of Standards, Washington, D.C., U.S.A.

Desbarats, George Joseph, C.M.G., B.Sc.—B. Quebec, Canada, 1861. Educ. various Public Schools; Ecole Polytechnique, Montreal and Laval University. Engineer on construction of canals and other public works; assistant to late John Page, Chief Engineer of Canals; Inspector, Railway Construction; Acting Deputy Minister of Marine and Fisheries, Ottawa, 1908-09; Deputy Minister, 1909-10; Plenipotentiary for Canada at the Radiotelegraph Conference held at London, England, 1912. Member of the Engineering Institute of Canada, 1897; Councillor, 1907; Vice-President, 1909; Plenipotentiary for Canada to International Seamen's Conference, Genoa, 1920. Deputy Minister and Comptroller of the Canadian Naval Service June, 1920. Deputy Minister Dept. National Defence, 1924. Address: Ottawa, Canada.

De Valbreuze, R.—B. 1877. Engineer-electrician (Ecole Supérieure Electricité Paris, 1903). Attached as Officer of Engineers to the Central Establishment of Military Telegraph Materiel. Left Army for industry. During the war was a Captain of Engineers attached to the Radiotelegraphic Centre in Paris. President for 1924 of the Société des Amis de la T.S.F., M.I.R.E., Member several French Technical Societies. Chevalier of the Legion of Honour. Address: 72, rue Bossière, Paris (xvie).

Dowsett, H. M.—B. London, 1879. Trained as an electrical engineer at Finsbury Technical College. In 1899 joined the engineering staff of the Wireless Telegraph & Signal Co., now known as Marconi's Wireless Telegraph Co., Ltd. Was associated with much of the early developmental work of this company, and after having erected stations ashore and afloat in many parts of the world, was appointed in charge of the test rooms and drawing office at the Hall Street Works, Chelmsford, in 1908. Has held the position of chief of the testing department of the New Street Works from 1912 to the present time.

M.I.E.E., F.Inst.P., M.I.R.E. Revised "Handbook of Technical Instructions for Wireless Telegraphists" for the second edition 1915 and third edition 1923, and is the author of "Wireless Telegraphy and Telephony: First Principles, Present Practice and Testing," 1920, and "Wireless Telephony and Broadcasting," 1924. Address: Marconi Works, Chelmsford.

Dubilier, William.—B. 1888 in U.S.A.—Educ. Cooper Technical Institute, New York City. President and Technical Director of the Dubilier Condenser and Radio Corporation, New York City. Technical Director of the Dubilier Condenser Co., Ltd., London. Inventor of the Ducon mica condenser; owner of over 200 radio patents and applications for radio equipment. M.I.R.E. (Amer.). Member of the Radio Club of America and of the Progress Club, New York. Address: Bronxville, New York.

Eccles, W. H., D.Sc., A.R.C.S., F.R.S.—B. Barrow-in-Furness, 1875. Entered Royal College of Science, South Kensington, in 1894. Three years later was appointed demonstrator in the Physics Laboratory at the College, and in 1898 graduated at the London University with first-class honours in Physics. In 1899 he entered Mr. Marconi's laboratory at Chelmsford and spent a great part of his time in the investigation of electrical oscillations of air wires and in "jiggers." Devised a laboratory method for testing and classifying coherers, and results of a later study of coherers were presented as one of his D.Sc. theses. In 1901 was appointed Head of the department of mathematics and physics at the South-Western Polytechnic, Chelsea, and afterwards University Reader in Graphics at University College, London. At various times Vice-President of the Institution of Electrical Engineers, of the Physical Society, of the Institute of Physics and of the International Union of Radiotelegraphic Science; First Chairman of the Wireless Section of the Institution of Electrical Engineers; President of the Radio Society of Great Britain. Since 1916, Professor of Electrical Engineering at Finsbury Technical College; Member of many Government Committees during the past ten years. Address: 13 Catherine Street, S.W.1.

Echevarri, Capt. J. A. V.—B. 1897. Educated King's College School. Gazetted Sub-Lieut. R.N.V.R. January, 1916. Subsequently became Capt. R.A.F. 1918. Appointed Assistant to Head of Wireless Telegraphy Board 1920. British Delegate at International Conference on Electrical Communications, Washington, D.C., 1920, also at International Technical Committee on Radio Communications, Paris, 1921. Appointed Secretary, Wireless Telegraph Board, 1924. Address: Junior Constitutional Club, W.1., and Sand Tiles, Cobham, Surrey.

Eckersley, Peter Pendleton, M.I.E.E.—B. La Puebla, Mexico, 1892. Educ. Bedales School and Manchester University. Engineering training at Mather & Platts and Lancashire Dynamo & Motor Co. Joined Royal Flying Corps as Wireless Equipment Officer, 1915, and served in the Middle East, Egypt and Salonica. Officer in Charge Wireless Training, Southern Brigade, 1916. Brigade Wireless Officer in France, 1917. Wireless Experimental Establishment, Biggin Hill, 1917; conducted experimental work on duplex telephony for aircraft. Joined Marconi Co., 1919, Head of Experimental Section, Aircraft Dept. Designed Croydon ground station transmitter. Head of Experimental Section, Designs Dept., 1921. First Regular Broadcasting in England from Writtle 2 MT. Appointed Chief Engineer, British Broadcasting

Co., 1923. Address: 140 Goldhurst Terrace, Hampstead.

Eichhorn, Gustav, Ph.D.—B. Dusseldorf (Germany), 1867. Took degree of Ph.D. at Zürich University. Entered the wireless telegraph laboratory of Prof. Braun and Siemens and Halske, in Berlin. For 18 months Managing Director of their experimental stations on the Baltic. Publications: *Drahtlose Telegraphie* (Liepzig, 1904), *Wireless Telegraphy* (London, 1906), *Drahtloser Überseeverkehr* (Zürich, 1921). Returned to Zürich as the representative of the Telefunkn Co., 1905, and launched the *Jahrbuch der drahtlosen Telegraphie und Telephonie*, 1907. Engaged in practical and theoretical work in wireless telegraphy and telephony. Now in the Institut für Radiotelephonie. Address: Hauptpostfach 6123, Zürich, Switzerland.

Elwell, Cyril Frank.—B. 1884. Educ. Fort St. Model Public School, Sydney, Australia; Stanford University, California (B.A. and E.E.); Chief Engineer Poulsen Wireless Telegraph and Telephone Company and Wireless Development Co., 1908; Federal Telegraph Co. 1909 to 1913, and Universal Radio Syndicate, London, 1913 to 1915. Man. Dir. C. F. Elwell, Ltd., 1915-23. Consulting Radio Engineer. Mem. I.E.E., Mem. Am. I.E.E., Mem. Ital. I.E.E., Fell. I.Rad.E. Clubs: Royal Automobile and Engineers, London. Addresses: 12 Craven House, Kingsway, London, and 20 Great Russell Mansions, 60 Great Russell Street, London.

Erskine-Murray, James, D.Sc., F.R.S.E.—B. Edinburgh, October 24th, 1868. After six years' study and research under the late Lord Kelvin at Glasgow University entered Trinity College, Cambridge, as a research student. Assistant Professor of Physics and Electrical Engineering in the Heriot-Watt College, Edinburgh, 1896-98. Appointed experimental assistant to Mr. Marconi, 1898. Lecturer and Demonstrator in Physics and Electrical Engineering at University College, Nottingham, 1900. Lecturer in Electrical Engineering at the George Coates Technical College, Paisley, 1905. Consulting work in radiotelegraphy, 1905. Lecturer on Radiotelegraphy at the Northampton Institute, London, 1907-11. Contributed papers to numerous learned societies and technical journals. Author of several works on wireless telegraphy. Partner in the firm of Clark, Forde, Taylor, and Erskine-Murray, consulting engineers, 1913-18. Served as Lieut.-Commander during the War with the Royal Air Force in charge of the design of wireless instruments and of experimental work till May, 1922. Now Experimental Engineer at H.M. Signal School, R.N. Barracks, Portsmouth. Fellow of the Inst. of Physics; Fellow of the Institute of Radio Engineers; Member of the Inst. of Electrical Engineers. Past President of Wireless Society of London. Club, Caledonian.

Escolano L'orca, Manuel, Capt. Spanish R.E.—B. Valencia, 1891. Educ. at R.E. College, Guadalajara, University College, London, and Marconi School at Chelmsford. As Lieutenant and Captain in the Military Wireless Service (C.E.T.), has contributed very largely to the development of military wireless. Joined the Marconi Co. in 1913. At present Chief Engineer of the Compañia Nacional de Telegrafia sin Hilos. Member of Institute of Radio Engineers. Address: Compañia Nacional de Telegrafia sin Hilos, Alcalá 43, Madrid.

Ferrié, General Gustave.—B. at St. Michel de Maurienne (Savoie), 1868. Educ. l'Ecole Poly-

technique, Paris. Was present in 1899 during experiments of Senatore Marconi between Wimereaux and Dover. Initiated French Military Radiotelegraphic Service in 1900. Was member of French Delegation to the International Electrical Congress of St. Louis in 1904. Member of the French Delegation to the International Radiotelegraphic Conference of London (1912). Appointed General Secretary of the International Time Conference, Paris (1913). Member of the Inter-Allied Wireless Technical Committee in Washington (1920). President of the Inter-Allied Technical Committee in Paris (1921). President L'Union Radiotélégraphique Scientifique Internationale. President of the International Commission on Longitudes. Technical Director of French Military Radiotelegraphy during the war. Member of the Academy of Science (Paris), D.Sc. (Oxford), Commander of the Legion of Honour. Author of the first work on wireless in France, and a large number of contributions on the subject of wireless telegraphy. Address: Commandant Supérieur de Troupes et Services de Transmissions, 51 bis, Boulevard de Latour-Maubourg, Paris, 7e.

Fessenden, Reginald Aubrey.—B. Milton, Canada, 1866. Educ. New York and Port Hope, Ontario. Inspecting engineer to the Edison Company, New York. Took up teaching work and conducted classes in physics and electrical engineering at Western University, 1892. Professor of Electrical Engineering at Western University, Philadelphia, 1893. Special Agent to the U.S. Weather Bureau, 1900. Has devoted much attention to the development of a system of wireless telegraphy known by his name, and has also carried out important experiments in wireless telephony.

Field, Rear-Admiral Sir F. L., K.C.B., C.M.G.—B. 1871. Entered Royal Navy, July, 1884; promoted Lieut., 1893; qualified as Torpedo Lieut., 1896. Promoted Commander, 1902; Captain, 1907; Commanded H.M.S. "Duncan," 1910; Superintendent of Signal Schools, 1912; Capt. H.M.S. "Vernon" (Torpedo School), 1914; Capt. H.M.S. "King George V" at Battle of Jutland; mentioned in despatches, awarded C.B. (Military division). Chief of Staff to Admiral Second-in-Command Grand Fleet, 1916. Awarded C.M.G. for this service. Director of Torpedoes and Mining at Admiralty, 1918. Promoted Rear-Admiral, 1919. Third Sea Lord and Controller of the Navy, 1920-1923. K.C.B., 1923. Rear Admiral Commanding Battle Cruiser Squadron, 1923. Member of Committee (appointed November, 1919) to advise British Government on Imperial W/T Communications. Associate Member of Institute of Naval Architects. Addresses: Admiralty, Whitehall, London, S.W.1, and United Services Club, Pall Mall.

Fisk, Ernest Thomas.—B. Sunbury-on-Thames, 1886. Joined Marconi Co. in England, 1905, trained and worked in all branches wireless engineering and operating in England, America and other countries. Undertook special mission to Arctic icefields in 1909 and to Australia in 1910, to demonstrate value of wireless equipment. Appointed General Manager Amalgamated Wireless (Australasia), Ltd., in 1913, and Managing Director in 1917. Built up Amalgamated Wireless (Australasia) Ltd. to its present stage of second largest wireless undertaking in British Empire. Successfully established design and manufacture of wireless apparatus in Australia. Conducted important wireless patent actions in Australia 1911 and 1912. Negotiated agree-

ment (1922) under which Amalgamated Wireless (Australasia), Ltd., took over all Government Wireless Services in Australia and Australian Government became largest shareholder in the Company. Received first direct wireless telegraph messages England to Australia, 1918. Gave first public demonstrations in Australia of wireless telephony and broadcasting in 1920. Received first direct transmissions of human voice from England to Australia, 1924. Member Institute of Radio Engineers, Associate Member Institute of Engineers (Australia), Member Royal Society of New South Wales. First President, Institute of Radio Engineers (Australia). Past President, Wireless Institute of Australia. Past Chairman, Section of Industry, Royal Society of New South Wales.

Fleming, John Ambrose, D.Sc., M.A., F.R.S.—B. Lancaster, 1849. Educ. University College School, London; University College; R. School of Mines. Sometime Fellow of St. John's College, Cambridge; Fellow and Hughes Gold Medallist, Royal Society; Albert Gold Medallist of The Royal Society of Arts, 1921. Lecturer in Mechanics and applied science, Cambridge University (1880). First Professor of Mathematics and Physics (1881); University College, Nottingham. First occupant of Pender Chair of Electrical Engineering, University College, London (1885). Vice-President of Radio Society of Great Britain. Sometime Vice-President of Institution of Electrical Engineers and Physical Society. Honorary Member of the Institution of Electrical Engineers. Honorary Member of the Royal Engineers Institute, Chatham. Scientific Adviser to the Edison and Swan United Electric Light Co., 1882-93. Scientific Adviser to the London Electric Supply Corporation, and many other corporations, firms and companies in electrical matters. Publications: Numerous contributions to scientific literature and research. Author of numerous well-known text-books, particularly on wireless telegraphy. Widely known as the inventor of the Thermionic Valve or Fleming Valve. University Professor of Electrical Engineering, University of London (1912). Address: The Pender Electrical Laboratory, University College, Gower Street, London, W.C.1.

Fortescue, Cecil L.—B. 1881. Educ. Oundle School and Christ's College, Cambridge. Engineering training with Messrs. Siemens Dynamo Co., Stafford, 1903-06. Civilian Instructor in Applied Mechanics and Electro-Technics at H.M. Gunnery and Torpedo Schools, Portsmouth, 1906. During the war attached to Wireless Telegraphy Department, H.M.S. "Vernon," and at H.M. Signal School, Portsmouth. Professor of Physics, Royal Naval College, Greenwich, January, 1911, to August, 1922; since then Professor of Electrical Engineering, City and Guilds (Engineering) College, M.I.E.E., serving on Committee of Wireless Section of that Institution. Fellow of the Institute of Physics. Member of the Physical Society of London, serving on the Council. Member of Sub-Committees "D" and "D 1" on Thermionic Valve of Radio Research Board, of the Department of Scientific and Industrial Research. Address: City and Guilds (Engineering) College, Exhibition Road, S.W.7.

Franklin, Charles Samuel.—B. 1879. Received engineering and scientific training at Finsbury Technical College. After some time spent in electrical work, first at Manchester and afterwards with the Norwich Electricity Company, joined Marconi's Wireless Telegraph Company (then known as the "Wireless Telegraph and Signal Company"), 1899 and still remains in

their service. He has during recent years been engaged in conducting experimental and research work on behalf of Senatore Marconi, and has a number of important patents to his credit.

Gainford, Rt. Hon. Lord, P.C. (Joseph Albert Pease).—B. 1860. Educ. Tottenham and Trinity College, Cambridge. Postmaster-General, 1916. Chairman of British Broadcasting Co., Ltd., and Vice-Chairman of Pease & Partners, Ltd. Addresses: 18 Mansfield Street, W.1, and Headlam Hall, Gainford.

Girardeau, Emile.—B. 1882. Educ. Ecole Polytechnique. Joined the Army and served as an officer in the Engineers. Managing Director Cie., Générale de Télégraphie Sans Fil, Ci. Radio-France, Société Française Radio-Electrique. Director of Radio-Maritime, Sté Anonyme Internationale de T.S.F. (S.A.I.T.), Sté. Radiotechnique, Sté Radio Romana, etc., etc. Author of various works on a number of subjects relating to wireless telegraphy. Officier de la Légion d'Honneur. Address: 79 Boulevard Haussmann, Paris (8e).

Glazebrook, Sir Richard Tetley, Kt., K.C.B., M.A., D.Sc., F.R.S.—B. Liverpool, 1854. Educ. Trinity College, Cambridge. Fifth Wrangler. Studied Physics as Graduate at the Cavendish Laboratory, Cambridge, under Clerk Maxwell and Lord Rayleigh. Fellow of Trinity College, Cambridge (1877). Principal of University College, Liverpool (1898-99). First Director of the National Physical Laboratory (1899-1919). Chairman of the Aeronautical Research Committee. Zaharoff Professor of Aviation and Director of the School of Aeronautics, Imperial College, 1920-23. Past President of the Institute of Electrical Engineers. Medal of the Royal Society of Arts (1918). Member of Technical Committee inquiring into Imperial Wireless scheme. Publications: Numerous works on Physical Optics, Heat, Light, Mechanics and Electricity, as well as numerous papers in Scientific Journals. Hon. Member Inst. C.E. Life Member Inst. Mech. E. Address: Ballards Oak, Limpsfield, Surrey.

Goldsmith, Prof. Alfred N., B.Sc., Ph.D.—B. New York City, 1887. Educ. Coll. of the City of New York, 1907; Ph.D. Columbia Univ., 1911. Consulting Radio Expert, U.S. Department of Justice, 1912. Consulting Radio Engineer Atlantic Communication Co., 1914. Consulting Engineer General Electrical Co., 1915-17. Director of Research, Marconi Wireless Telegraph Co. of America, 1917-19. Associated Professor in charge of electrical engineering, College of City of New York, since 1924. Chief Broadcast Engineer, Radio Corporation of America since 1924. Editor, "Proceedings of the Institute of Radio Engineers," since 1912. Member U.S. Federal Radio Commission, 1922 and 1923. Made investigations in simplex and duplex radio telegraphy and telephony, transmission of canal rays, precision measurements in radio engineering. Author, "Radio Telephony" (Wireless Press), 1918, "Radio Measurements," "Radio Frequency Changers" (Proceedings of the Institute of Radio Engineers), 1915, "World Communication" (Journal of the American Institute of Engineers), 1921. "Radiophone Reception," 1923. Technical Director U.S. Signal Corps School of Communication, 1917-18, U.S. Naval Radio School, 1917-18. Fellow, A.I.E.E., I.R.E., hon. member Radio Club of America, Radio Society of Great Britain, American Physical Society. Club: the Static. Addresses: Van Cortlandt Park South and Saxon Avenue, New York, and 450 West End Avenue, New York, N.Y.

Gordon-Thomsen, Wm.—B. Copenhagen, 1867. Civil Engineer, 1895. Engineer in the Telephone Company of Jutland from 1896, and later Chief of the Technical Department. Chief of the Technical Department in the State Telegraph Board, 1910. Representative of the State Telegraph Board at the office of the Commander-in-Chief for Jutland-Funen, 1903-10. Representative of the Telegraph Directory at the Chief Military Command in Copenhagen, 1911-17. Member of the Radio Telegraph Commission of 1920. Inspector of Wireless Installations from 1923. Knight of Dannebrog. Address: Osterbrogade 19, Copenhagen O, Denmark.

Gottwaldt, Commander B. L.—B. Christiania, 1880. Entered Naval Academy, Norwegian Navy, 1898. Graduated sub-lieutenant, 1901. Studied electrical engineering, telegraphy, telephony and wireless telegraphy at the Technical College, Charlottenburg. In charge of W/T in the Royal Norwegian Navy, where he was responsible for the erection of naval, land and ship stations, 1909. Appointed Commander, 1912. One of the Norwegian delegates at the International Radio Conference in London, 1912. Late Inspector of W/T, Norwegian Nav. Department. Technical Manager, Norwegian Wireless Company (Norsk Marconikompani). Address: 15, Baldersgate, Oslo.

Grattan, Commander Ernest Loftus Colley, R.N. (Ret.), D.S.O.—B. 1884. Educ. Dublin, Stubbington House, Fareham. Lieut. 1905, submarines 1906, Lieut.-Commander 1913. Lent for special service at Gallipoli for wireless telegraphy and signal stations; Dispatches (2), D.S.O.; W.T. stations at Malta, 1916; Admiralty in charge shore W.T. and signal stations, 1918; Act. Commander July, 1918; retired 1921; Assist.-Inspector of W.T., G.P.O., 1921; Officer in charge Abu Zabal Radio, 1924. Address: Nutfield, Ascot.

Gray, Andrew, A.G.T.T., M.I.E.E., Assoc. M.Inst.C.E.—B. Glasgow, 1873. Educ. Glasgow University; Royal Technical College. Diploma of latter in electrical engineering. Served as assistant to late Professor Andrew Jamieson, of Royal Technical College. Joined the West India and Panama Telegraph Company, Ltd. (1893). Entered Marconi Company, 1899. Introduced Marconi system to Hawaiian Islands. Organised telegraph working and training of native operators of Inter-island Telegraph Company of Honolulu. Appointed Chief of Staff to the Marconi Company in 1901, and in that capacity organised the working of the ship and shore wireless service; designed the original 1½ kw. Ship Set, and supervised the ship and shore operating until 1906, when the engineering and traffic work were separated. Chief Engineer of the Marconi Parent Company 1910, Joint General Manager 1923. Address: 78 Creffield Road, Acton, W.3.

Gredsted, M.—B. Copenhagen, 1873. Politic Degree, 1910. Telegraphist in the Government Telegraph Service, 1895. Chief to Ministry of Public Works, Telegraph Department, 1916. Chairman of the Telegraph Examination Board, 1917. Chief of Wireless Instruction, 1923. Inspector of Wireless Installations from 1923. Delegate of International Telegraph Conferences, Paris 1920, and Riga 1921. Knight of Dannebrog. Address: Vesterbrogade 40, Copenhagen B, Denmark.

Guthrie, Frederick Preston.—B. Augusta County, Virginia, 1891. Educ. Chamberlain-Hunt Academy, Port Gibson, Miss. Graduated

from Washington Lee University, A.B. Degree, 1911. Vanderbilt Fellow in Astronomy, University of Virginia, 1911-12. Professor of Science, Miami Military Institute, Germantown, Ohio, 1912-13. Assistant Professor of Physics. The Citadel (the Military College of South Carolina) Charleston, S.C., 1913-17. Enlisted in South Carolina Naval Militia, 1915; promoted to Lieutenant, 1916; called to active duty in U.S. Navy, 1917, remaining on active duty until 1919; served at Charleston Navy Yard and in office of Director Naval Communications, Navy Department, Washington, D.C.; 1919, assigned to duty with United States Shipping Board Emergency Fleet Corporation by order of Secretary of Navy, to organise Radio Service. Became District Manager for Radio Corporation of America with headquarters in Washington, D.C., 1923. Member of American Delegation to meeting of Technical Committee on Inter-Allied Radio Communication, which met in Paris, 1921. Member of Inter-Department Advisory Committee on Government Radio Broadcasting, 1922 and 1923. M.I.R.E., Member Army and Navy Club, Washington, D.C. Author, Communication Regulations, U.S. Navy, 1918. Address: 1110 Connecticut Avenue, Washington, D.C.

Hammond, John Hays, Jr.—B. San Francisco, Cal., 1888. Educ. Sheffield Scientific School (Yale), 1910; Sc.D., George Washington University. Inventor of type of torpedo for coast defence, controlled by wireless energy from coast fortifications. Invented system of automobile torpedo firing type, in latest battleships of U.S.; also aluminothermic incendiary projectiles employed by Allied armies in the Great War; and a radio system of control of ships, employed on U.S.S. "Iowa," for target practice. Has applied for over 224 patents in U.S. and Europe, relating to radio telegraphy and telephony and wirelessly controlled torpedos. Consulting Engineer the Radio Corporation of America; and also member of Board of Directors of that company. U.S. delegate Radiotelegraphic Convention, London, 1912. M.I.R.E. America (ex-Treasurer, etc.). Fellow, American Geographical Society, Associate Member American Society M.E. Member Royal Society of Arts, London. Clubs: Eastern Yacht, Yale, Engineers, University. Home: Gloucester, Mass.

Harbord, James G.—Major-General (Ret.).—B. Bloomington, Ill., 1866. Graduated Kansas State Agricultural College, 1886. Served with U.S. Army as 2nd Lieut. 1891. Service in Cuba, Porto Rico and the Philippines, covering some 16 years, during which period he won many distinctions. Appointed Lieut.-Col. 1917, and accompanied Gen. Pershing to France as Chief of Staff, serving in this capacity during the period of organisation of the A. E. F. Commanded the Marine Brigade of the Second Division in the Verdun Sector, and during the fighting in the Bois de Belleau, Buresches, and near Chateau Thierry. Promoted Major-General of the National Army, 1918, and commanded the Second Division at Soissons. Returned to U.S. 1919, and promoted Major-General U.S. Army. Deputy Chief of Staff U.S. Army. Elected President Radio Corporation of America January 1st, 1923.

Harrison, Lieut.-Col. Norman, C.M.G., D.S.O., M.I.E.E.—B. 1873. Educ. in Natal. Served in South African War and European War, 1914-19, as Director of Army Signals in German South-West Africa, and as Assistant Director of Army Signals, and Commanding South African

Signal Units (attached to Corps of Royal Engineers) in France, 1916-19. Engineer-in-Chief of Posts and Telegraphs, Union of South Africa since 1910 to 1921. Under Secretary 1922 to date. Addresses: (1) G.P.O., Pretoria; (2) Pretoria Club, Pretoria; (3) Civil Services Club, Capetown.

Haynes, Frederick Henry.—Educ. Hornsey County School. Demonstrator, Science Department, Tottenham Polytechnic, 1911-14. Lieutenant Royal Engineers, served with British Expeditionary Force and in Near East; erection and maintenance of semi-permanent wireless stations. Later Lieutenant Royal Corps of Signals. Assistant Editor "Wireless World and Radio Review." Author of "The Amateur's Book of Wireless Circuits," and numerous articles and other publications for the experimenting wireless amateur. Council and General Committee Member of the Radio Society of Great Britain.

Hazetne, Louis Alan.—B. 1887. Educ. Stevens Institute of Technology. In testing dept. of General Electric Co., 1906. Successively Assistant, Instructor, Assistant Professor and Acting Professor in the Electrical Engineering Department, and, since 1918, Professor and Head of that Department of the Stevens Institute. Consulting Engineer and inventor. Assisted, with Albert F. Ganz, Inc., in electrolysis investigation. Member of American Committee on Electrolysis, and Chairman of the Electrolysis Committee of the American Gas Association. Read paper on "Oscillating Audion Circuits" before the Institute of Radio Engineers in 1917. Connected, during the war, with the Radio Laboratory in the Washington Navy Yard. Designed S.E. 1420 receiver, and took a large part in the design of the Neutrodyne Receiver. Was member of three Radio Conferences called by the Secretary of Commerce to consider the control of Radio by that Department. Manager of the Institute of Radio Engineers, and member of American Institute of Electrical Engineers, American Society of Mechanical Engineers, Institute of Radio Engineers, and American Physical Society. Address: Stevens Institute of Technology, Hoboken, N.J.

Hogan, John V. L.—B. Philadelphia, Pa., U.S.A. Educ. Sheffield Scientific School, Yale University. Assistant to Dr. Lee de Forest, 1906-1907. Joined National Electric Signalling Co. at Brant Rock, Mass., 1909. Telegraph Superintendent, 1910-11. Chief of Operating Inspection and Erection, 1911-14. With International Radio Telegraph Co. (successor of National Electric Signalling Co.), as Chief Research Engineer, 1914-17. Commercial Manager, 1917-18. Manager, 1918-21. Now Consulting Engineer, specialising in radio, acoustics and patent matters. Fellow, Manager and Past-President, Institute of Radio Engineers. Member, American Institute of Electrical Engineers, American Association for Advancement of Science, Radio Club of America, and other technical societies. Author of several books, articles and treatises on wireless telegraphy and telephony. Address: 41, Park Row, New York City, U.S.A. Residence, Forest Hills, Long Island, N.Y.

Holmstroem, J. Gunnar.—B. Stockholm, 1874. Passed through Poly. Acad. Stockholm, 1896. Assistant Royal Swedish Telegraph Dept., 1892. Teacher at Swedish Artillery and Engineers' College, 1904, and College for Naval Officers, 1908. Director of Radiotelegraphic Instruction, Stockholm, Kt. of "Vasa" Order. Address: Malmkillnadsgatan 19 B, Stockholm.

Hooper, Commander Stanford C., U.S. Navy.—B. 1884, Colton, Cal. Educ. at San Bernardino, California. Started his career as telegraph operator in the Southern Pacific Company. Entered the Naval Academy, Annapolis, Md., 1901. Graduated 1905. Served as midshipman on the cruiser "Chicago," destroyer "Perry," and monitor "Wyoming." Lieutenant 1910, Lieutenant-Commander 1915, Commander 1918. Instructor of electrical engineering, physics, and chemistry at the U.S. Naval Academy, 1910-11. Fleet Radio Officer of the United States Atlantic Fleet, 1912-13. Early in the war acted as observer in Europe. In charge of the Radio Division Bureau of Steam Engineering, Navy Department, 1915-17. Commanded the destroyer "Fairfax" in the Atlantic during 1917-18, then returned to take up duties as Chief of Radio Development in the Bureau of Engineering attached to the U.S. Navy. On duty as Radio Officer U.S. Fleets, on board U.S.S. "Seattle," beginning August 4th, 1923. Address: Navy Dept., Washington, U.S.A.

Howe, Prof. George William Osborn, D.Sc.—B. 1875, Charlton, Kent. Educ. the Roan School, Greenwich, Woolwich Polytechnic, Durham University. Nine years with Siemens Bros., at Woolwich, and Siemens and Halske, at Charlottenburg. Lecturer and later Assistant Professor of Electrical Engineering at the City and Guilds Engineering College, South Kensington. Head of the Department of Electric Standards and Electric Measurements at the National Physical Laboratory, 1921. Appointed in the same year to James Watt Chair of Electrical Engineering in the University of Glasgow. D.Sc. of Durham, Hon. D.Sc. of Adelaide University. Whitworth Scholar. Has read several papers on Radiotelegraphy before the Royal Society, the British Association, the Physical Society, etc. Awarded the silver medal by the Royal Society of Arts (1912) for his paper on "Some recent Developments in Wireless Telegraphy." Member of the Radio Research Board. Address: The University, Glasgow.

Isaacs, Godfrey C.—Educ. England, France and Germany. Began life in his father's business and later became manager. Deputy-Chairman and Managing Director of Marconi's Wireless Telegraph Co., Ltd., and Managing Director of the Marconi International Marine Communication Company, Limited till November 1924, when he relinquished these posts on account of health. Address: Lyne Grove, Virginia Water, Surrey.

Jackson, Admiral of the Fleet (retired), Sir Henry Bradwardine, G.C.B., K.C.V.O., D.Sc., LL.D., F.R.S.—B. Barnsley, 1855. Educ. Chester and Stubbington. Entered Royal Navy, 1868. Capt. 1896; Rear Admiral, 1906; Controller of Navy, 1905-08; Commanded 6th Cruiser Squadron, 1908-10; Chief of Naval War Staff, 1912-14; First Sea Lord, May, 1915-December, 1916; President R.N. College, Greenwich, 1917-19. Hon. Vice-President of Inst. of Naval Architects. Past-President of Radio Society of Great Britain. Chairman of Radio Research Board, M.I.E.E., Hon. D.Sc. Leeds and Oxon and LL.D. (Cantab.). Whilst Commander of H.M.S. "Edinburgh," in 1893, conceived the idea of using Hertzian waves for naval signalling purposes. Continued to take much interest in the development of W/T, and assisted in its organisation in the Navy. Addresses: 37 Catherine Street, London, S.W.1, and The Athenæum Club.

James, William.—Educ. Chiswick Polytechnic. Served in army 1915-1919 in wireless section Royal Engineers. Assistant Editor "Wireless World and Radio Review." Author of "Wireless Valve Transmitters," "Home Constructor's Wireless Guide," etc., and numerous articles.

Janet, Paul.—B. 1863, Paris. Studied at the Lycée Louis-le-Grand and the High School. Member of the French Society of Physics, the French Society of Electricians, and the Society of Civil Engineers of France. Professor of Physics at the University of Grenoble, 1886-94. Member de l'Institut. Professor of University of Paris, Director of the Central Laboratory and of the High School of Electricity. Author of several important works. Address: Ecole Supérieure d'Electricité, 12 and 14, Rue de Staël, Paris (xve).

Kajima, Akira.—B. Tokyo, 1883. Graduated from the Greek Catholic Mission High School, Tokyo, 1904, and became Interpreter at the French Embassy from 1905 to 1906. Joined the editorial staff of "Chuo Shimbun" in 1906, and that of the "Kokumin Shimbun" in 1908. Established the Japanese Wireless Press Agency in 1911; Managing Director, the Nippon Radio Telegraphy and Telephony Co., Ltd., 1920. Adviser to the Department of Communications, 1922; proprietor, Nikka Radio Co., 1923. Address: "Musentsushin-sha," opposite to Hibiya Library, Tokyo.

Kellaway, Rt. Hon. Frederick George.—B. Bishopston, Bristol, 1870. Educ. Bishopston, Bristol. P.C. 1920. Parliamentary Secretary Ministry of Munitions, 1916. Deputy Minister of Munitions, 1918. Secretary to Department of Overseas Trade, 1920. Postmaster-General, April, 1921. Member of Parliament, Coalition Liberal, Bedford, from December, 1910 to November, 1922. Joined Board of Marconi Wireless Telegraphy Co., November, 1922. During his term of office as P.M.G., was responsible for the institution of Broadcasting and Wireless Telephony.

Kennedy, Sir A. B. W., F.R.S.—B. London, 1847. Some time President of the Institution of Civil Engineers, and the Institution of Mechanical Engineers. Professor of Engineering at University College, London, 1874-89, and founded there the first "Engineering Laboratory." Designed electric lighting and power stations for many companies and corporations, and has also been engaged in railway and constructive work. Knighted 1905 for his services to the Admiralty. Member of the Technical Committee appointed by the Postmaster-General to consider the Imperial Wireless Scheme. Associate Member of the Ordnance Committee. Consulting Electrical Engineer to the L.N.W.R., L.S.W.R., S.E.&C.R., and the London County Council. Chairman of the Electn. of Railways Advisory Committee (Ministry of Transport). Addresses: A, 7 The Albany, Piccadilly, and Broadway Court, S.W.

Kennelly, A. E.—B. Colaba, Bombay, 1861. Educ. in England, Belgium, France and Italy. Past-President of the American Institute of Electrical Engineers, Past-President of the American Association of Illuminating Engineers; President, in 1916, of the Institute of Radio Engineers; Vice-President of the International Electrical Congresses, Paris and Turin. Left school in 1875 to become a telegraph operator in the Eastern Telegraph Company. Chief electrician on Cable Ship, 1881. Principal electrical assistant to Thomas A. Edison, 1886-92. Consulting Engineer in Philadelphia.

In partnership with E. J. Houston, of the Thomson-Houston Company, 1893-1900, Engineer-in-Chief when the cables were laid from Vera Cruz to Campeche, 1902. Professor of Electrical Engineering at Harvard University since 1902 and also at Massachusetts Institute of Technology since 1914. Hon. Sc.D., University, Pittsburgh, Pa., and Toulouse, France. Chev. Légion d'Honneur. Hon. Member Inst. Electrical Engineers, London, and of Soc. Française des Electriciens, Paris, and a Vice-President of the American Academy of Arts and Sciences. Has written twenty-five books as author or collaborator, and more than 150 scientific papers. Some time Chairman and Secretary of Standards Committee, American Institute of Electrical Engineers, President and Secretary of the American Committee of the International Electro-Technical Commission. Member National Ac. Sciences. A delegate to the Inter-allied Radiotechnical Committee in Paris, 1921. Has specialised in alternating currents. Address: Harvard University, Cambridge, Mass., U.S.A.

Kolster, Frederick A.—B. Geneva, Switzerland, 1883. Educ. Public Schools of Cambridge, Mass., and at Harvard University. Assistant to John Stone Stone, 1902-08. Assistant to Lee De Forest, 1909-12, Chief of Radio Section Bureau of Standards, 1912-21, since when Consulting Engineer, Federal Telegraph Co. Attaché to American Delegation representing the U.S. at London International Radio Convention, 1912. Inventor of Kolster decimeter, radio compass and position finder, Directional Radio Systems, and other devices. Fellow I.R.E. (Amer.), Member I.E.E. (Amer.), Fellow G.S. (Amer.). Address: Cosmos Club, Washington, D.C.; Engineers Club, San Francisco, Cal.; or c/o Federal Telegraph Co., Palo Alto, California, U.S.A.

Koomans, Nicolaas.—B. 1879, at Delft. Studied at Delft for mechanical and electro-technical engineer, obtaining his certificate 1901. Entered the Government Telegraph Service. Grad. 1908 at Technical High School at Delft as Doctor in Technical Sciences. Joint-founder and editor of the Monthly Review of Telephony and Telegraphy. Joint-founder and member of the managing board of the Dutch Society for Radiotelegraphy (Nederlandsche Vereeniging voor Radiotelegrafie). Member of the International Electro-technical Commission. Member of State Patent Office. Professor in Physics and Theoretical Electrical Engineering at the school of the Dutch Post and Telegraph Administration. Supervises the instruction of all the higher officials. Address: Willem de Zwijgerlaan 133, The Hague, Holland.

Korn, Professor Arthur.—B. Breslau, Germany, 1870. Studied at Leipsic and Paris. Professor of Physics, University of Munich, 1903-08. Best known as the inventor of a system of telegraphic transmission of photographs, and in 1907 the first photograph was transmitted under this system from Munich to Berlin. Inventor of a system of telautography and wireless phototelegraphy. Author of several mathematical works of a mechanical theory of gravitation and electricity. Professor at Polytechnical High School, Charlottenburg, Berlin. Address: Charlottenburg, Berlin Schlüterstrasse 25.

Koto, Major-General, Teizo.—B. Yamaguchi Prefecture, 1873. Entered the military service as cadet in the 6th Engineering Battalion, 1892, and promoted to 1st Lieutenant, 1898. Entered the Technical College of the Tokyo Imperia

University as a special student of School of Artillery and Engineering, 1900, and graduated therefrom, 1903. Served in the Russo-Japanese War as the chief of the Field Telegraphy Corps, 1904. Promoted Major and appointed an Inspector of the Military Technical Department, 1905. Appointed Member of the Military Wireless Investigation Committee, 1910. Proceeded to China for the erection of a radio station on Chinwangtao, 1912. Promoted Colonel and Chief of the Communications Department of the Tsingtau Garrison, 1915. Promoted Major-General and Military Engineer, 1919. Connected with the Japan American Radio Telegraph Co. and commissioned by Formosa Government, 1923. Address: 68, Tani-Machi, Ichigaya, Ushigome, Tokyo.

Krupp, T. F.—B. Copenhagen, 1868. Lawyer 1891. Head clerk to Criminal Judge at Frederiksberg, 1891. Assistant in the Ministry of Home Affairs, 1894. Assistant to Copenhagen Harbour Administration, 1896-1907. Chief of Ministry of Public Works, 1912. Vice-President of the Electricity Commission, 1907; Chairman from 1916. Chairman of the Cement Commission, 1917. Member and Secretary of the Telephone Commission of 1917, from 1917; Chairman from 1920. Chairman of the "Gudena" Commission and other Commissions concerning water power plants, 1918, and of the Commission regarding Long Distance Radio Telegraph Stations. Knight of Dannebrog. Director-General of Telegraphs and Telephones, 1923. Address: Frederiksberg Allé 55, Copenhagen V, Denmark.

Lagorio, E., Capitaine de Vaisseau.—B. 1869. Attached to Sous-Secrétariat des Postes et des Télégraphes as Director of Service de la T.S.F. (16th June, 1920). Address: Service de la T.S.F., 5, Rue Froidevaux, Paris.

Latour, Marius.—B. 1875, in France. Educ. University of Paris and Ecole Supérieure d'Electricité, Paris. For many years Consulting Engineer to the General Electric Co., at Schenectady, N.Y. His numerous inventions include improvements in dynamo-electrical machinery and several types of A.C. motors bear his name. Invented the high-frequency alternator with reduced number of stator slots known as the S. F. R. alternator, installed at numerous medium and high power stations, including Lyons, Coltano and Ste. Assise. During the war engaged in research work at the laboratories of the Établissement Central de la Télégraphie Militaire under Général Ferrié. His system of elimination of interference produced in telephone lines by neighbouring high-tension power lines has been installed throughout the whole of Northern France. Has specialised in the development of high and low frequency thermionic amplifiers. Fitted the Ste. Assise high power station with his system of balanced multiple earth leads. Consulting Engineer to the Société Française Radio-Electrique, Paris; Ateliers de Constructions Electriques, Jeumont; Compagnie Française de Radiophonie, Paris; and Liaisons Télégraphiques and Téléphoniques (L.T.T.) Conflans Ste. Honorine. Member International Union of Scientific Radiotelegraphy; Chevalier de la Légion d'Honneur. Vice-President of the Société Française des Electriciens. Member of the American Institute of Electrical Engineers. Member of the Institute of Radio Engineers. Head Lecturer at the Ecole Supérieure d'Electricité, Paris. Address: 8, Square Desaix, Paris—XV.

Listrom, Axel Sigurd.—B. Falun, Dalecarlia, 1881. Entered the Telegraph Service, 1900.

Inspector of Wireless Installations, 1913. Chief Engineer at the Radio Division of the Royal Telegraph Administration, Stockholm, 1920. Address: Frejgatan, 58, Stockholm.

Ljungqvist, Seth.—B. Falun, Dalecarlia, Sweden, 1880. Passed Maturity Examination, 1899, and Examination of Electro-Technical Branch, Technical University, Stockholm, 1904. Entered the Telegraph Service, 1899. Chief of the Radio Division in the Royal Swedish Telegraph Department, Stockholm, 1916. Address: Vanadisvägen 23, Stockholm.

Lodge, Sir Oliver, D.Sc., F.R.S., Hon. Sc.D. Cantab., Hon. D.Sc. (Oxon.), Hon. LL.D.—B. Penkull, Staffs, 1851. Educ. at Newport (Salop) Grammar School; Entered University College, London, 1873. Graduated D.Sc. 1878. Reader in natural philosophy at Bedford College for Women, and Assistant Professor of Physics in University College, London, for several years, and Professor of Physics at University College, Liverpool, 1881-1900. The First Principal of Birmingham University, 1900. Knighted 1902. Retired 1919. Original investigations on lightning, the seat of the electromotive force in the voltaic cell, the phenomena of electrolysis and the speed of the ion, the motion of the ether near the earth, and electromagnetic waves and wireless telegraphy. His patent (1897) for syntonic wireless telegraphy was extended for seven years by Lord Parker, and was acquired by the Marconi Co. in 1911. Has held the position of President of the British Association, President of the Physical Society, and of the Society for Psychical Research. Has made many important contributions to the literature of science, amongst which are "Modern Views of Electricity" (Macmillan), "Electrons" (Bell), "The Ether of Space" (Harper's), "Mechanics" (Chambers), "Atoms and Rays" (Benn). Clubs: Athenæum, Author's. Address: Normanton, Lake, Salisbury.

Loring, Commander F. G., R.N.—Inspector of Wireless Telegraphy, General Post Office. Entered the Navy in 1882 (retired 1910). In charge of Admiralty shore wireless stations 1902-08. Admiralty delegate at Berlin International Conference on Wireless Telegraphy, 1906. Appointed Inspector of Wireless Telegraphy, 1908. Post Office delegate at International Conference on Wireless Telegraphy, London, 1912. Technical Adviser to the Board of Trade on Wireless matters at International Conference on Safety of Life at Sea, London, 1914. Address: The Old House, Foot's Cray, Kent.

Lyons, Colonel Henry George, D.Sc., F.R.S.—B. 1864. Educ. Wellington College. Director and Secretary Science Museum since 1920. Director-General of the Survey Department in Egypt, 1898-1909. Victoria Research Medal. R. Geog. Soc., 1911. Symons Gold Medal of Royal Meteorological Society, 1922. Member of the Meteorological Committee. Commandant Army Meteorological Services during the War; Acting Director Meteorological Office, 1918-19. Chairman of Sub-Committee "B" on Atmospherics of Radio Research Board of the Department of Scientific and Industrial Research. Chairman National Committee for Geodesy and Geophysics. Address: 3, Cambridge Square, W.2.

Makower, A. J.—B. 1876. Educ. University College School, Gower Street, and at the College itself, between 1884 and 1895. Studied at Trinity College, Cambridge, taking degree 1898. Proceeded to Technical School, Charlottenburg, Germany. Joined the British Thomson-Houston.

Company, Rugby. Received an appointment as Head of the Electrical Engineering Department. At one time Secretary of the Board of Studies in Electrical Engineering, and Chairman of the Board of Examiners in Electrical Engineering. Author of many papers on wireless subjects. Resigned his teaching post and became managing director of Mossay & Co., Ltd., designers and selling agents for commercial electric vehicles, 1918. Chairman of the Electric Vehicle Committee of the Society of Motor Manufacturers and Traders. Addresses: 12, Greencroft Gardens, N.W.6, National Liberal Club, and The Oxford and Cambridge Musical Club, and 7, Prince's Street, S.W.

Marchant, Edgar Walford, D.Sc.—B. 1876. Educ. University School, Hastings, and Central Technical College. Graduated B.Sc. at London University with honours in physics and mathematics, and subsequently took the degree of D.Sc. After serving an apprenticeship appointed Superintendent of Lord Blythwood's laboratory and workshops at Renfrew, N.B., 1897, where he carried out many experiments in wireless telegraphy. Leaving Renfrew in 1900, served as chief assistant for one year at the Finsbury Technical College under the late Professor Silvanus P. Thompson. Lecturer in electro-technics at University College, Liverpool, 1901, and later Professor of Electrical Engineering. Closely associated with the late Mr. Duddell in the development of the oscillograph. Author of a number of articles on wireless and cognate subjects, including a short book on "Radio-telegraphy and Telephony." David Jardine Professor of Electrical Engineering in the University of Liverpool. Vice-President of the Radio Society of Great Britain. Past President of the Liverpool Engineering Society, Past Chairman of the Manchester Section of the Institution of Electrical Engineers. Address: 2 Ivanhoe Road, Sefton Road, Liverpool. University Club, Liverpool; Royal Liverpool Club.

Marchant, W. H.—B. London, 1881. Commenced experimental work in connection with W/T, 1904. From 1906-11 he served with De Forest Syndicate, Poulsen Company, and Lepel and Anglo-German W/T Companies, being chiefly engaged in experimental work. Since 1911 he has devoted himself mainly to literary work and to teaching. At present in the service of the Eastern Telegraph Co., at their London training centre. Address: 4, Branch Hill Side, Hampstead, N.W.3.

Marconi, Senatore Guglielmo, G.C.V.O., LL.D., D.Sc.—B. Bologna, Italy, 1874. Irish on his mother's side. Educ. Leghorn and Bologna. First interested himself in the problem of wireless telegraphy, 1895. Visited England 1896, and took out the first patent ever granted for a practical system of wireless telegraphy by the use of electric waves. Earliest experiments in England made at Westbourne Park. The Italian Government conferred upon him the honour of knighthood. He has been decorated by the King of Italy and the late Czar of Russia, is an honorary doctor of many universities, besides having received the freedom of the principal Italian cities. In 1909 (in conjunction with Professor Braun) he was awarded the Nobel Prize for Physics. In 1912 he was decorated with the Grand Cross of Alfonso XII and made Grand Officer of the Order of St. Maurice and Lazarus. Elected a senator in the Italian Parliament (1914). On July 24th, 1914, the King bestowed upon him the Honorary Knighthood of the Grand Cross of the Victorian Order. He also holds many scientific awards granted by various

societies and institutions, including the Albert Medal of the Royal Society of Arts, of which he is Vice-President. April 12th, 1915, Awarded the Gold Medal of I.R.E. (America) College of the City of New York, June 20th, 1922, and John Fritz Gold Medal for the Invention of Wireless Telegraphy, July 6th, 1922. Immediately on the declaration of war by Italy, he was given the rank of Lieutenant in the Italian Army. He has been employed on important military missions to England by the Italian Government, and on July 29th, 1916, was promoted Captain "for exceptional services." At the beginning of September, 1916, he was transferred from the Italian Engineer Service to be Commander in the Navy. He visited the United States, 1917, as Member of the Official Mission sent by Italy to the U.S.A. Government. On June 26th, 1919, he was appointed by H.M. the King of Italy Plenipotentiary Delegate to the Peace Conference at Paris, and in this capacity he signed the Peace Treaties with Austria and Bulgaria. At the end of 1919, he was awarded the Italian Military Cross. He has been decorated with the Italian "Ordine Civile" of Savoy, and has been nominated by the King of Italy to be a member of the Supreme Council of the same Order. He is Chairman of the Board of Directors of the Marconi Company. Address: Marconi House, Strand, W.C.2.

Marriott, Robert Henry.—B. 1879. First experimented with wireless telegraphy in 1899, while student at the Ohio State University, U.S.A. Employed by the American Wireless Telephone and Telegraph Company, Philadelphia, 1901, for which company he erected stations at Breille, Galilee and Barnegat, N.J. Chief Engineer of the Pacific and Continental Wireless Telephone and Telegraph Company. Installed three stations in California, at Avalon, Santa Catalina Island and San Pedro, 1902. Employed with the Carstarphen Electric Company at Denver, Colorado, 1903. Constructed stations for the American De Forest Wireless Telegraph Company, and its successor, the United Wireless Telegraph Company, in Colorado, Wyoming, and Texas, 1905. In charge of this Company's construction and maintenance, 1910. Entered Marconi Wireless Telegraph Company of America, 1911. Entered the U.S. Government service as Radio Inspector, 1912. Now Radio Engineer, Puget Sound Navy Yard, Washington. First President of the Institute of Radio Engineers.

McLachlan, Norman W., D.Sc. (Eng.).—B. Longtown, Cumberland, 1888. Educ. Carlisle Grammar School and the George Watson and the Heriot-Watt Colleges, Edinburgh, and Liverpool University. Served apprenticeship with Messrs. Bruce, Peebles & Co. In 1909 was appointed Lecturer in Engineering and Mathematics at Newcastle-on-Tyne. In 1913 Supervisor of Classes in Engineering Subjects in the Liverpool Technical Institutes. During the war carried out much research work for Government in aeronautics and anti-submarine devices, organising a laboratory at Air Ministry for research on liquid and gaseous oxygen apparatus for aircraft use. After the Armistice engaged in magneto research at the National Physical Laboratory, Teddington. At present Independent Research Engineer in service of Marconi Company. Associate of the Heriot-Watt College and a D.Sc. (Engineering) of the University of London. M.I.E.E., Fellow P.S.-Lond. Fellow Inst. P. Author of many papers on various subjects in the Journal of the Institution of Electrical Engineers and other scientific journals. Holds patents for Wireless

Telegraphy and allied subjects. Inventor of Magnetic Drum Recorder for relaying and recording wireless signals at high speeds. Addresses: Marconi Works, Chelmsford, and Engineers' Club.

McPherson, Andrew.—B. 1880. Educ. at Allen Glen's School and the Royal Technical College, Glasgow. Engineering Training with the Electric Construction Co., Ltd., of Wolverhampton. Was appointed Assistant Engineer to the Public Works Department of the Nigerian Government, Chief Engineer of the Nova Empresa Luz Electrica, Maceio, Brazil, and later Engineer and Manager of the Madeira Electric Lighting and Power (1909) Co., Ltd., Funchal, Madeira. Joined the G.P.O. in connection with the original scheme for the Imperial Wireless Chain, and in 1915 was transferred to the Admiralty in connection with Wireless Telegraphy Engineering. From 1915 to 1917 was engaged in inspecting and reporting on Wireless Telegraphy Stations abroad. At present Head of the Wireless Shore Station Division of H.M. Signal School, Portsmouth. Address: 22, Cousin's Grove, Southsea, Hants.

Meissner Alexander, Dr. Tech. Dr. Eng.—B. Vienna, 1883. Studied at Technical High School and University, Vienna; became assistant at the Technical High School. Joined the Laboratory of the Telefunken Company, Berlin; prominent part there in the development of the technique of wireless in Germany, having been responsible for the introduction of the Flat-coil, musical quenched sparks, timed sparks, Telefunken compass, interference-reception, direct current cathode valve relay for Morse reception, valve generator, etc. Address: Berlin W. Mathäikirchstr 11.

Mesny, René.—B. 1874. Educ. The Naval School, Brest. Naval Officer 1894, Professor of Naval Construction in the Naval School, 1901. During the war attached to the wireless service. Now attached to the Laboratoire de la Radio-télégraphie Militaire. Officer of the Legion of Honour, Member of the Société de Physique and the Société des Electriciens. Secretary of the Société des Amis de la T.S.F. Address: Direction du Matériel de la Radio-télégraphie Militaire, 51 bis, Bd. Latour-Maubourg, Paris.

Mezeviris, Greg. Commander, R.N.—Born 1891. Educ. Royal Naval College, 1906-1910. Officer of the R.N., 1910. Served during the Balkan War (1912) on different ships, 1913-1915 in submarine service. Specialised as torpedo officer and served on the battleship "Averoff." Appointed to the Naval War Staff (1917). During the European war served on destroyers. In 1919 appointed to the Torpedo School as professor of electricity. Promoted commander in 1920. Sent by the Greek Government to Paris, followed a special course on wireless telegraphy at the "Ecole Supérieure d'Electricité" during the period 1920-1921, and obtained the diploma of radio-engineer. On his return to Greece was appointed chief of the technical department and first assistant to the Head of the Radiotelegraphic service of the Navy. Chief of the main Athens station and Professor at the Radiotelegraphic School. Since 1922 he has also been professor of Electricity at the Military Academy and the Royal Naval College. Author of six books on electricity and wireless and contributor of many articles to the "Naval Review." In the end of 1923 he was appointed Head of the Radiotelegraph Service of the Navy. Address: 24 Ithakis Street, Athens.

Mullard, S. R., M.B.E.—B. 1883. Educ. Private and London Electrical Engineering Colleges. Apprenticed to London firm of electrical engineers; 1908, Assistant Works Manager Société Anonyme de Usines Pintsch. 1910 to 1915, Head of Research Laboratory, Edison & Swan, Ltd. (here developed the "Pointolite" arc lamp). 1916 to 1918, Lieut. R.N.V.R., attached to R.N.A.S. for wireless duties. 1918 to 1919, Capt. R.A.F., Head of Wireless Section Research Laboratory, Imperial College of Science, on behalf of Air Ministry. 1919 to 1920, Research in wireless valve manufacture and development. Contractor to H.M. Government for wireless valves. September, 1920, formed the Mullard Radio Valve Co., Ltd. Appointed Managing Director of the Company. Club: Royal Air Force. Address: 45, Nightingale Lane, S.W.12.

Nally, Edward Julian. B. Philadelphia, 1859. Pioneer in different modes of communication in America in telegraph, telephone and wireless. Started as a messenger boy for Western Union Telegraph Co., St. Louis, worked his way up through various steps to the position of First Vice-President and General Manager of the Postal Telegraph Cable Company, which he resigned in 1913 to accept the office of Vice-President and General Manager of the Marconi Wireless Telegraph Company of America. Under his management the first commercial wireless circuit was opened to the public between the United States and Japan in 1914. During the period of the war commercial wireless service by private companies was interrupted, but immediately upon the return of the stations by the United States Government on March 1st, 1920, he established the first direct commercial wireless circuit between the United States and Great Britain, which was soon followed by similar services to Norway, Germany and France. Upon the formation of the Radio Corporation of America, in 1919, he was elected President and Director, which position he resigned in 1922 to become Managing Director of International Relations (R.C.A.). 1923 elected Managing Director Commercial Radio International Committee. Clubs: Century, Interallie (Paris), Lawyers, Caxton, Static, Bookfellows. Societies: Pennsylvania, China, American Geographical, National Geographical, Ends of Earth, American Irish Historical, Friendly Sons of St. Patrick. Residence: El-Ar-En Farm, New Hamburg, N.Y. Business address: Woolworth Building, New York City; 20 Rue de la Paix, Paris.

Navarro y Ortiz, D. Benito, Major, Spanish Royal Engineers.—Chief of the Wireless Service of the Army permanent land stations (1918). In 1913 took charge of the Spanish Army Station of Carabanchel EGC (Madrid), until 1918. Decorated by the Spanish Government with the White Military Cross (December, 1919) for his knowledge and merit in wireless matters. Has contributed largely to the development of wireless telegraphy in Spain.

Noble, Sir William.—B. 1861. Educ. Public Schools and Gordon's College, Aberdeen. Commenced his career in Aberdeen Telegraph Office as a telegraphist. In 1893, Engineer for the north-east area of Scotland. In 1897 promoted to Headquarters, London, as First-class Engineer. Subsequently successively Technical Officer, Assistant Superintending Engineer, London, Staff Engineer at Headquarters, Superintending Engineer, London, and in 1912 Assistant-Engineer-in-Chief, succeeding to the premier position in June, 1919. Retired January, 1922. Now Director of General Electric Co. and of British Broadcasting Co.

In 1919 the King of the Belgians made him a "Chevalier de l'Ordre de la Couronne." Knighted June, 1920. Contributed articles to "Encyclopædia Britannica" on Telegraphy and Telephony, and paper to I.E.E., M.I.E.E., Inst. P.O.E.E. Addresses: Royal Automobile Club, and National Liberal Club, The Chase, Blackdown, Leamington Spa, and Magnet House, Kingsway, W.C.2.

Norman, Major the Rt. Hon. Sir Henry, B.A., 1st Bt. cr. 1915, Kt. cr. 1906. M.P. Blackburn 1910-23. J.P. B. Leicester, 1858. Educ. privately in France; Harvard University (B.A.); Leipsig University; Officer of Legion of Honour; Mons Star, 1914. Assistant Postmaster-General, 1910; Chairman War Office Committee on W/T (1912); Member of Committee on National Telegraphic Research and P.O. Telegraph Organisation Committee; Member of British Association Committee of Radiotelegraphic Investigation and of International Committee of Radiotelegraphic Research; Chairman of Imperial Wireless Telegraphy Committee (reported May, 1920); Vice-President of Radio Society of Great Britain; Fellow of Physical Society; Fellow of American Institute of Radio Engineers; Liaison Officer with French Government for Military Inventions; Vice-Chairman Imperial Communications Committee from March, 1919, to November, 1922, and Chairman of Wireless Sub-Committee. Member Broadcasting Committee, 1923. Addresses: The Corner House, Cowley Street, S.W.1; Ramster, Chiddingfold, Surrey. Clubs: Reform, Royal Automobile, Ranelagh.

Pannill, Charles Jackson.—B. Petersburg, Va., 1879. Entered U.S. Navy 1898, Chief Telegraphist of United States Coast Signal Service. Entered service of Professor Reginald A. Fessenden, 1902. Conducted experiments in radio communication across Hampton Roads. Installed communication by radio between New York and Philadelphia, 1903. Installed first radio outfit on United States battleship. Conducted experiments between stations of General Electric Company at Lynn and Schenectady; also between Brant Rock, Mass., and Machrihanish Bay, Scotland. Entered service of Marconi Wireless Telegraph Company of America, 1912. Superintendent, Southern Division. Entered service of United States Government, 1914 as expert radio aid, Naval Radio Service, shortly after outbreak of world war. Promoted to Assistant to Director Naval Communications in charge of commercial radio service, 1917. Now Vice-President and General Manager Independent Wireless Telegraph Company, New York. Fellow Institute of Radio Engineers. Member Washington Society of Engineers. Member of the Geographical Society. Member Westchester Biltmore Country Club.

Pedersen, P. O.—B. at Sig, near Varde, Jutland, 1874. Entered Royal Technical College, Copenhagen (1892). Cand. Polytechnic (1897). Chief Engineer of Telegrafonen, Ltd. (Poulsen Patent), 1899-1902. Lecturer at the Royal Technical College, Copenhagen, and Professor from 1912. On board of Dansk Telegrafonfabrik (Danish Telephone Co., Ltd.), 1903-12, as well as on Elektroteknisk Forening (Electrotechnical Association) from 1910; Chairman from 1916. President Danish Institute of Civil Engineers—1920-23. Director of Det Kontinentale Syndikat for Poulsen Radiotelegrafi (Continental Syndicate for Poulsen Radiotelegraphy) from 1911-19. Member of International Electrotechnical Commission, Fel-

low Inst. Radio Engineers since 1915. Fellow Am. Inst. Electrical Engineers since 1920. Member of the Institution of Electrical Engineers 1924. Member of Academy of Engineering Sciences, Stockholm, 1924, and a Fellow Royal Danish Academy of Science since 1917. Member of the Telephone Commission (1917), of the Control Committee of licensed Telephone Companies, of the Commission on the training of radio operators, and of the Radio Commission of 1920. Technical Adviser in Radio to the Department of Public Works, 1922. Principal of and Professor in the Royal Technical College, Copenhagen. His contributions to electrotechnical literature have been both important and numerous. Address: Amalievej 1, Copenhagen, V. Denmark.

Peri, Francois Michel, B. 1871. Educ. Lycée National, Toulon. Commandant of Colonial Infantry. Officer of the Legion of Honour. Planned the wireless chain in Indo-China, comprising 15 stations and 2 D.F. installations. During the war he supervised the construction of the high-power station at Doua, which on and after September 21st, 1914, secured communication with Russia and, later, with America. Introduced the first C.W. apparatus for aircraft, employing vacuum tubes of his own invention. Specialist in vacuum tubes. Inventor of the intertwined type of grid and anode, the zig-zag calibrated grids of great rigidity (patent acquired by the Cie Generale de T.S.F.). Co-inventor of the French valve (Peri-Biquet Patent, acquired by the Marconi Company). Inventor of the resistance coupling for amplification (patent acquired by the Soc. Française Radioelectrique), of the electrostatic microphone condenser, and of various appliances for the protection of receiving apparatus from atmospheric disturbances. Constructed and inaugurated in March, 1923, the large station at Yunnanfon (China), equipped with high-frequency alternators. Consulting Engineer to the Société Radiotechnique. Address: 65, Avenue de Neuilly, Neuilly-sur-Seine.

Petavel, Sir Joseph Ernest, K.B.E., D.Sc., F.R.S.—B. 1873. Educ. University College, London. Scientific Research at the Royal Institution and at the Davy Faraday Laboratory, 1896-98. John Harling Fellow, Owens College, Manchester, 1900-03. Scientific Manager, Low Temperature Exhibit of the British Royal Commission for the St. Louis Exhibition, 1904. Professor of Engineering and Director of the Whitworth Engineering Laboratories, University of Manchester, 1908-19. At present Director National Physical Laboratory, Teddington. Publications: Papers in the Philosophical Transactions of the Royal Society, "The Philosophical Magazine," "Engineering," etc. Member of Aeronautical Research Committee and other Government Committees connected with Aviation. Member of Committee on Imperial Wireless Scheme. Clubs: Athenæum; Royal Automobile, Primrose Club, London. Address: National Physical Laboratory, Teddington, Middlesex.

Pickard, Greenleaf Whittier.—B. Portland, Me., 1877. Educ. Westbrook Seminary, Harvard, and Mass. Institute of Technology. Began radio work 1899, at Blue Hill Observatory, Milton, Mass., under a grant from the Smithsonian Institution. Became associated with Harry Shoemaker, 1901. On the engineering staff of the American Telephone and Telegraph Company, 1902-06. Developed a practical system of radiotelephony, obtaining successful speech transmission without wires, 1902

From 1906 until the present date has been connected with the Wireless Specialty Apparatus Company as consulting engineer. Inventor of a method of reducing static interference, which was extensively used by the U.S. Navy for transatlantic reception during the war. Practices extensively as patent expert in wireless patent litigation, and is the author of many papers on radio communication. Fellow of the American Institute of Electrical Engineers. Member of the American Electrochemical Society. Member of the Society of Mechanical Engineers. Past President and Fellow of the Institute of Radio Engineers. Private address: Newton Centre, Mass. Office address: 76, Atherton Street, Jamaica Plain, Mass.

Pocock, Hugh S.—Editor "The Year Book of Wireless Telegraphy and Telephony" prior to outbreak of war. Captain Royal Engineers, serving Egypt, Mesopotamia, Persia, on intelligence duties. Mentioned in dispatches for wireless services in Mesopotamia. Editor "The Wireless World and Radio Review." Member of the Institute of Radio Engineers, and Committee Member of the Radio Society of Great Britain. Address: 20, Brondesbury Villas, N.W.6.

Pomey, Jean-Baptiste.—B. Paris, 1861. Educ. Ecole Polytechnique. Entered the service of the Administration of Posts and Telegraphs in 1881 and became in time Inspector-General. Assistant Professor of Mechanics at the Ecole Polytechnique, Lauréat de l'Institut, Professor of Theoretical Electricity at the Ecole Supérieure des Postes and Telegraphs. Director of this School and of the Service for study and technical research. During the war was Chief of the Telegraph Service, first at Coul and later with the Eastern Army. Was appointed Assistant to the Director of Military Radiotelegraphy with the rank of Lieutenant-Colonel, Officer of the Legion of Honour.

Poulsen, Valuemar, Eng., D.Sc., D.Ph., Leipzig (1909).—B. Copenhagen, 1869. Studied at University of Copenhagen, 1889-93. Entered technical department Copenhagen Telephone Company, 1893, and for a number of years superintended electrical testing operations. Collaborated with Prof. P. O. Pedersen for many years. Member of the board of the Telegrafonen, Ltd. (Poulsen Patent), 1902-16. Joined board of Dansk Telegrafonfabrik, Ltd., 1909, and that of Poulsen Wireless Telephone and Telegraph Company, U.S.A. (1909-11). Fellow of Danish Society of Sciences (1914). Grand Prix at Paris in 1900 for telephone work. Invented in 1903 the arc method of generating continuous electrical waves of wireless frequencies. Address: Gentofte Møllegaardsvej 6, Copenhagen.

Rego, Capt., T. R. Moraes.—B. Rio de Janeiro, 1882. Completed training at Naval Academy, 1900. Served for a few years on ships, studying electricity and torpedoes. Torpedo-Lieutenant in the Professional Torpedo School. Began studying radiotelegraphy when first wireless stations were installed in Brazilian Navy, 1904. Assistant in the Radio Department of the Navy on several occasions. Appointed (1914) Chief of the Radio Service, Brazilian Navy, which post he resigned to be appointed Commander of warship "Alagoas" in 1920, resigning this command in 1922, and being then appointed Sub-Chief Military Staff of President of the Republic of Brazil. Club: Naval Club. Address: Palacio Presidencial, Cattete, Rio de Janeiro, and Rua Ipanema 22, Copacabana, Rio de Janeiro.

Reith, John Charles Walsham, M.Sc., A.M.I.C.E., A.M.I.Mech.E.—B. 1889. in Scotland. Educ. the Glasgow Academy, Gresham's School, Norfolk, and the Royal Technical College, Glasgow. Engineering apprenticeship in Glasgow, 1912-14. Engineer with S. Pearson & Son, Ltd., London. Service in France, Oct., 1914—Nov., 1915, with Royal Engineers (Major). Wounded. In charge of American munitions contracts in America 1916-17; engaged on special construction work in England, latterly with the Admiralty, 1918-19; after Armistice in charge of liquidation of armament and engineering contracts, 1919-20. General Manager of William Beardmore & Co., Ltd., Coatbridge, 1920-22. Managing Director of the British Broadcasting Company, Ltd., 1922. Clubs: Caledonian and Cavendish, London; Western, Glasgow.

Reoch, Alexander.—B. Sheffield, England, 1884. Educ. Sheffield Science School and Sheffield University College. Graduated in electrical engineering, 1902. Entered the service of the English Marconi Company in June, 1902, and undertook construction and operating work in England, Holland, Germany, and Egypt. Appointed engineer with the Canadian Marconi Company, 1905, and from 1909 to 1911 in complete charge of the business during which time that company's contract with the Canadian Government for the operation of the Great Lakes stations was negotiated, as well as the contract between the Canadian Company and the Newfoundland Government. Chief Engineer of the Canadian Marconi Company, 1917, and at the beginning of 1918 he relinquished this position to take an appointment on the engineering staff of the American Marconi Company. Appointed, 1920, Plant Engineer, Radio Corporation of America. Appointed January 1st, 1921, Assistant Chief Engineer Radio Corporation of America. Fellow Institute Radio Engineers. Associate Member Engineering Institute of Canada. Member Franklin Institute of the State of Pennsylvania. Address: 66, Broad Street, New York.

Rivers-Moore, H.R., B.Sc., A.C.G.I., A.M.I.C.E., A.M.I.E.E., F.R.S.A.—B. 1884. Educ. at Wellington College and London University. Apprenticeship George Clark, Ltd., Engineers, Sunderland. Post Office Engineer-in-Chief's Dept., 1907. Delegate to 2nd International Telegraph Conference at Paris, 1910. Appointed to Wireless Section of the Post Office, December, 1910. In 1913 purchased and carried on the business of the Wilson Apparatus Co. In 1916 this business was taken over by the Indo-European Telegraph Co., Ltd., and associated successively with Messrs Creed & Co., Ltd., Croydon, and Automatic Telephone Co., Ltd., Liverpool. Appointed in 1918 Asst. Physicist at Admiralty Anti-Submarine Dept. Parkstone Quay, and subsequently given the rank of Hon. Capt. Marines. In 1919 organised the firm of "R. M. Radio, Ltd.," and is Chairman of this Company and of General Wireless, Ltd.

Robinson, James, M.Sc., Ph.D.—B. 1884. Educ. University of Durham and University of Gottingen. Lecturer in Physics, University of Durham, 1906-7. Lecturer in Mathematics, Armstrong College, 1909-10. Lecturer and Demonstrator in Physics, University of Sheffield, 1910-12. Lecturer in Physics, East London College, University of London, 1912-15. Examiner in Physics, University of London, 1912-15. Lieut. R.N.V.R. for Wireless Duties, 1915-17. Lieut., R.N.V.R., attached R.N.A.S. for Experimental Wireless Duties, 1917-18. Captain

R.N.A.S. for similar duties, 1918-20. Chief Experimental Officer, Instrument Design Establishment, Biggin Hill, 1920-22. Head of Department for Wireless and Photography, Royal Aircraft Establishment, Farnborough, 1922. Responsible for various Patents. F.Inst.P. Fellow Physical Society of London. Member Radio Society of Great Britain. Address: R.A.F. Club, 128, Piccadilly, W.1, or Royal Aircraft Establishment, South Farnborough, Hants.

Rodrigues, Apolinio Gomes da Silva, Flag Captain in the Portuguese Navy.—B. 1866. Entered Portuguese Navy in 1886. Became Professor of Electricity and Torpedoes at the Naval College in 1902, and Professor of Electricity of Naval Auxiliary College, 1905. Entrusted with embodiment of Naval Regulations concerning wireless in 1909. Elected Member of Advisory Committee on wireless in the Portuguese Navy in 1910.

Rutherford, Sir Ernest, Kt., F.R.S.—B. New Zealand, 1871. Educ. Nelson College, Canterbury College, New Zealand University, Cambridge University. Cavendish Professor of Experimental Physics, Cambridge, and Fellow of Trinity College, 1898-1907, Professor of Physics, McGill University, Montreal, 1907-1919, Professor of Physics, University of Manchester. Nobel Laureate, 1908. Has published many works dealing with the conduction of electricity through gases and radio activity. Address: Newnham Cottage, Cambridge.

Rydin, Sven Ludvig Herman.—B. Upsala, 1861. Graduated in Law, Upsala, 1885. Registrar attached to the Board of the State Railways, 1895-96, assistant to Director of the State Railways 1896-97, Member of the Board of Telegraphs 1897-1902, Under-Secretary of State for Home Affairs 1902. Since 1905 Director-General of Telegraphs in Sweden. Grand Commander of the "Nordstjaerna." Member of "Idun," Society in Stockholm for Science, Literature and Art, and of the Royal Swedish Yacht Club (Kungl. Svenska Segel Sällskapet, K.S.S.S.). Address: Kungl. Telegrafstyrelsen, Stockholm.

Salmond, Captain J. S. C., R.N.—B. 1882. Entered "Britannia," 1897, left 1898. Served in China in "Barfleur," landed in the Boxer operations, 1900. Mentioned in despatches. Qualified as torpedo lieutenant, 1905. Served in Wireless Telegraphy Experimental Department, "Vernon," 1908-11. Fleet Wireless Telegraphy Officer, Home Fleet (later Grand Fleet), 1912-15. Wireless Telegraphy Assistant to D.N.O. Admiralty, 1915-17. In command of "Odin," in Red Sea, 1917-19, mentioned in despatches for operations against Turkish forces in the Asir and Yemen. Served in Signal Division, Admiralty, on Wireless Telegraphy duties. Member of Radio Research Board. Commanding H.M.S. "Yarmouth," wireless telegraphy experimental ship.

Saltzman, Charles McKinley, Major-General, Chief Signal Officer.—B. 1871, State of Iowa. Started business as railway telegraphist and graduated at West Point, 1896. As cavalry officer took part in the Spanish-American War, 1898. Transferred to the Signal Corps of the U.S. Army, 1901. Since identified with the electrical cable and radio work, U.S. Army. In charge of the radio work of the U.S. Army on the Panama Canal. Represented the United States at the International Radiotelegraphic Conference of London, 1912. Member of the Inter-Departmental Board which

prepared regulations for the control of radio telegraphy in the U.S.A., 1912 to 1913. Appointed C.S.O. of the Army with rank of Major-General. Address: Washington, D.C.

Sankey, Captain M. P. H. Riall, C.B., C.B.E., R.E. (ret.).—B. Nenagh, Ireland, 1853. Educ. Switzerland, Royal Military Academy, Woolwich, School of Military Engineering, Chatham. Served in England, at Gibraltar, and as Instructor in Fortification at the Royal Military College, Kingston, Canada. Posted to the British Ordnance Survey, and had charge of the Trigonometrical Division, the Electrotyping Department and the Workshops. Retired from the service (1889) to join the Board of Messrs. Willans and Robinson, Ltd., and (1904) took up consulting work. Shortly afterwards joined the Boards of Marconi's Wireless Telegraph Company, Limited, and the Marconi International Marine Communication Company, Limited. Also a Director of several other companies. Served during war as Hon. Engineering Adviser to the Director of Fortifications and Works. Author of "The Energy Chart," "Practical Application to Reciprocating Steam Engines," Part IV of Rivington's "Construction" (anonymously). Translated from German Prof. Ritter's book on "Bridges and Roofs." Contributed numerous papers to I.C.E., I.M.E., I.E.E., Inst. Naval Architects, Royal Society of Arts, Royal Society, etc., etc. Member of the following institutions: Civil Engineers, Mechanical Engineers (President 1920 and 1921), American Mechanical Engineers, Electrical Engineers, Royal Institution of Great Britain, Iron and Steel, Naval Architects, Junior Engineers, and Gas Engineers. Member of the Governing Board of the National Physical Laboratory and of the Wireless Telegraphy and Gaseous Explosives Committees of the British Association. Address: 57, Castle Bar Road, Ealing, W.5.

Sarnoff, David.—B. in Russia 1891. Entered the United States 1900, and later became an American citizen. Employed as a messenger by the Commercial Cable Company, 1906. Entered the employ of the Marconi Wireless Telegraph Co. of America as office boy, 1906. Wireless operator at Siasconset Station, Nantucket Island, 1908. Manager, Marconi Station, Sea Gate, New York, 1909. Radio Inspector for Marconi Company and Instructor, Marconi Institute, 1912. Became Commercial Manager of the Marconi Company of America, 1917, and when that Company was absorbed by the Radio Corporation of America, was taken over as Commercial Manager of that concern, and became General Manager, 1921. Vice-President and General Manager, Radio Corporation, 1922. Member of the American Institute of Electrical Engineers; Fellow of the Institute of Radio Engineers; Member New York State Chamber of Commerce, and of the American Railway Association. Clubs: Railroad Club, Whitehall Club, Lotus Club. Address: 180, Pennsylvania Avenue, Chester Hill Park, Mount Vernon, New York.

Schwill, Fr.—B. Strasburg (in Alsace), 1875. Started career as member of the German Post and Telegraph Service. Took part in the International Radiotelegraphic Conference at Berlin in 1906. Appointed by the Swiss Federal Government to the International Bureau of the Telegraphic Union to organise and supervise the new Radiotelegraphic section established by the Berlin Conference. Present position, Sub-Director of the International Bureau of the Telegraphic Union at Berne.

Address: Bureau International de L'Union Télégraphique, Berne.

Scott-Taggart, John.—Educ. Bolton Grammar School, technical establishments and King's College, London. For four years was Departmental Manager and Research Engineer, Radio Communication Company, Ltd., Managing Director of Radio Press, Ltd., and Editor of *Modern Wireless* and of *Wireless Weekly*. Sometime in charge of valve design and construction at Ediswan Lamp Works. Served 1914 to 1919: sometime Instructor of Wireless to 1st Army, but chiefly Wireless Officer to various units. Mentioned in despatches. Awarded Military Cross. Author of various papers before British Association and other societies, and numerous articles: also the volumes: "Thermionic Tubes in Radio Telegraphy and Telephony," "Elementary Text-book in Wireless Vacuum Tubes," "Wireless Valves Simply Explained," "Practical Wireless Valve Circuits," etc., etc. Fellow of the Institute of Physics and holds membership in the Physical Society and the British, American and French Institutions of Electrical Engineers. Address: Bush House, Aldwych, London, W.C.2.

Shaughnessy, Edward, H., O.B.E.—B. 1871. Engineer-in-charge wireless section, Engineering Department, British Post Office. Entered Post Office Engineering Department, 1896, served in experimental, testing, telegraph and cable sections, specialising on underground and submarine cables. Member of the Radio Research Board. Post Office representative on Committee of Wireless Section, Institution of Electrical Engineers. Vice-President, Radio Society of Great Britain, Examiner in Telegraphy for the City and Guilds of London Institute. Member of some committees and panels of the British Engineering Standards Association. Address: Engineering Department, General Post Office, London.

Simpson, Lt.-Col. Adrian C.M.G. (late) R.E.—B. Edinburgh, 1880. Educ. Clifton and Sandhurst. Commissioned in His Majesty's Forces, 1900. Served in India, being transferred to the Regular Indian Army. Retired 1907. Becoming interested in wireless telegraphy, and started work with the English De Forest Wireless Telegraph Syndicate. His connection with Marconi's Wireless Telegraph Company commenced with his joining the Field Station Department. On the formation of the Russian Company of Wireless Telegraphs and Telephones, 1908, appointed managing director of that company. During the war served in Russia; and at the War Office. Late Director of Wireless Telegraphy under the Government of India. Deputy Managing Director of Marconi's Wireless Telegraph Co., Ltd., and The Marconi International Marine Communication Co., Ltd., Chevalier of Order of St. Anne, 3rd Degree, and of Order of St. Stanislaus. Addresses: Marconi House, Strand, W.C.2., The Naval and Military Club, and Ranelagh.

Sinclair, Duncan.—B. in London, 1896, Educ. Aske's Hatcham and King's College, University of London, and abroad. Entered Royal Flying Corps 1915 as wireless officer, and served in France 1916-18, and in Russia, 1919. Instructor at R.A.F. Electrical and Wireless School, 1918. Mentioned in despatches and awarded Order of St. Stanislaus. Appointed to Signals Branch, Air Ministry, 1920, and now in charge of Civil Aviation Signalling under Group Captain Blandy, C.B., D.S.O., the head of the Branch. Appointed to Controllerate of Communications, Air Ministry, 1920. To date has been actively engaged upon air route signals organisation, and commercial aeroplane,

seaplane, flying boat and airship wireless. Author of papers on "Signalling on our Airways," "Airsip Wireless in 1921," "The Applications of Wireless to Commercial Flying," "The Wireless Stations of the British Air Routes," etc. Member of American Institute of Radio Engineers, and Radio Society of Great Britain Address, Air Ministry.

Slee, Commander J. A., C.B.E., R.N. (Ret.)—B. 1878, Wimbledon. Educ. on training ship "Britannia." Passed for his lieutenant's commission, and after service on the "Decoy," "Ernest," "Anson," and "Severn," qualified as Torpedo Lieutenant, and spent a year on the staff of the "Defiance" at Devonport, where he gained his first wireless experience, 1901. Whilst attached to H.M.S. "Queen," 1906, eyesight trouble developed and he was obliged to transfer to shore service. For two years after quitting the sea he served as one of the Wireless Telegraph Experimental Officers on the "Vernon" at Portsmouth, and from 1908 until 1919 was in charge of all shore wireless, and war signal stations in Great Britain. Promoted Acting Commander, 1913. Acting Captain, 1918. On the formation of the Wireless Board was appointed its chief. Awarded C.B.E., 1919. Retired from the Navy December, 1919, with the rank of Commander. Joined the Marconi International Marine Communication Co. as Technical Superintendent and Adviser, January 1st, 1920. Appointed Technical Manager, M.I.M.C. Co., Ltd., June, 1921. Address: 7, Elvaston Place, London.

Smith, Tom Vincent, Major, M.C.—B. 1872, in London. Joined the Amalgamated Radio Telegraph Company in 1906, Director of the British Radio Telegraph Company. Consulting engineer until outbreak of war. Served on the Civil Aerial Transport Committee, and the Wireless Committee of the Institution of Electrical Engineers. Past Pres. of the National Association of Supervising Electricians. Papers before the Royal Artillery Institution at Woolwich, and the British Association. During the war was in charge of R.F.C. wireless on the Western Front, and later Officer-in-Charge of Wireless at the Air Ministry for all theatres of war. Decorations: Military Cross, Knight of the Military Order of Savoy, 1914-15 Star. Twice mentioned in despatches. Address: 60 Knightsbridge, S.W.1.

Smith-Rose, Reginald Leslie, Ph.D., M.Sc.—B. 1894. Educ. Imperial College of Science and Technology. Practical experience with Messrs. Siemens Bros., Woolwich, from 1915-19, engaged on experimental work in connection with military, manual and automatic telephones; and latterly with thermionic valve amplifiers for telephone lines and wireless receiving sets. Now Assistant-in-Charge of the Wireless Division of the National Physical Laboratory, engaged on general Radio Research. Member of Committee "C" on Directional Wireless, of the Radio Research Board of the Department of Scientific and Industrial Research. Physicist-in-Charge of Directional Wireless Research under Committee "C" of the Radio Research Board. Fellow of Physical Society of London. Member of Council of the Radio Society of Great Britain. Member of Wireless Sectional Committee of the Institution of Electrical Engineers. Author of several scientific paper and articles. Address: National Physical Laboratory, Teddington.

Snell, Sir John Francis Cleverton, Kt. (Cr.1914.) B. Saltash, Cornwall, 1869. Educ. Plymouth Grammar School, and King's College, London, 1883. With Messrs. Woodhouse & Rawson, and with Messrs. Crompton & Co., at the Kensington

Court and Notting Hill Power Stations, and at Stockholm (Sweden), 1892. Resident Engineer at King's Road Station, St. Pancras, 1896, Borough Electrical and Tramways Engineer, Sunderland, 1906, in private practice as a Consulting Engineer, 1910, became partner of Messrs. Preece, Cardew, Snell and Rider, Consulting Engineers, 1919. Relinquished partnership and accepted position of Electrical Adviser to the Board of Trade and Chief Electricity Commissioner-designate, 1920, appointed Chairman of the Electricity Commission. Member of the Nitrogen Products Committee (Ministry of Munitions), and Chairman of the Power Sub-Committee. Member of the Electrical Trades Committee (Board of Trade). Member of the Electrical Power Supply Committee (Board of Trade). Member of the Advisory Council for Scientific and Industrial Research. Member of the Imperial Wireless Telegraphy Committee. Member of the Electrification of Railways Advisory Committee. Past Pres. I.E.E. Member of Council I.C.E. Fellow I.E.E. (Amer.). Contributed: "Distribution of Electrical Energy," 1906 (Spon); "Power House Design," Second Edition, 1921 (Longmans); and many papers read before several Engineering Institutions. Addresses: "Southernway," by St. Martha's, Guildford, Electricity Commission, Gwydyr House, Whitehall, S.W., The Athenæum, St. Stephens and Royal Fowey Yacht Clubs.

Sqniar, Major-General Sir George Owen K.C.M.G., Ph.D.—Educ. Johns Hopkins University, Baltimore. Grad. Doctor of Physics 1893. Research student under the late Professor Rowland and in the laboratory of the late Sir William Preece at the British General Post Office. Discovered the use of living trees as a means of receiving wireless messages 1904, and published a paper entitled "The Absorption of Electro-Magnetic Waves by Living Vegetable Organisms." Author of numerous papers on the subject of wireless telegraphy and has devoted special attention to the use of wireless telegraphy in military operations. In 1896 the City of Philadelphia awarded him the John Scott Legacy Medal and premium for the polarising photo-chronograph. Awarded the Elliott Cresson Gold Medal for his researches in multiplex telephony, 1912. Member of National Academy of Sciences, 1919. Awarded the Franklin Medal, 1919. Awarded the Distinguished Service Medal, United States Army, 1919. In 1919 decorated with the insignia of the Order of Knight Commander of St. Michael and St. George. In 1922 awarded the Italian decoration, Commander of Order of the Crown. In 1922 awarded Cross of a Commander of the French Legion of Honour. In 1923 appointed Honorary Knight Commander of the Most Distinguished Order of St. Michael and St. George. Chief Signal Officer U.S. Army. Formerly Military Attaché to the American Embassy in London. Representative at the Conference of Interallied Radio Technical Committee, at Paris, 1921. Appointed an ex-officio member representing War Department of the United States National Committee, International Electrotechnical Commission. Address: War Department, Washington, D.C., U.S.A.

Swinburne, James, F.R.S.—Educ. Clifton College, 1870-74; apprenticed engineering works, 1874-9. Employed by Messrs. J. W. Swan & Co. (1881) to organise their lamp factory in Paris. Consulting Engineer since 894. Author of many papers before Scientific and Technical Societies, and in Technical Press. Member of the Technical Committees considering

the Imperial Wireless Scheme, 1912 and 1919-20. Member of various scientific societies. President of the Institution of Electrical Engineers, 1902-3. Addresses: 82, Victoria Street, S.W.1; Woodhurst, Oxted, Surrey.

Swinton, Alan A. Campbell, F.R.S.—B. Scotland, 1863. Opened career in 1882 at the Armstrong Works, Elswick. Consulting electrical engineer in London since 1887, having been responsible for the carrying out of many large electrical installations. Chairman of Crompton & Co., Ltd., and director of several electricity supply and engineering manufacturing companies. Associated with the development of the Parsons turbine and other important inventions. A vice-President of the Royal Society of Arts; a vice-President of the Institution of Electrical Engineers; Chairman of the British Scientific Instruments Research Association; a Member of the Executive Committee of the Board of the National Physical Laboratory; a member of the Broadcasting Board; Past President of the Röntgen Society; a Manager of the R. Institution of Great Britain (1912-15). Member of Sub-committee "B" on Atmospherics of Radio Research, Board of the Department of Scientific and Industrial Research. Past President of the Radio Society of Great Britain. Has devoted considerable attention to scientific research, including wireless telegraphy. M.Inst.C.E., M.I.E.E., M.I.Mech.E. Clubs, Athenæum, Carlton, etc. Addresses: 66, Victoria Street, Westminster, S.W.1; 40 Chester Square, S.W.1.

Thornblad, Thor.—B. Upsala, Sweden, 1885. His interest in the theory and practice of wireless dates from 1899. Author of the first Swedish standard work on wireless telegraphy, "Traad-loes Telegrafi" (932 pages), published by P. A. Norstedt & Soeners Foerlag, Stockholm, 1911. Passed examination as student at the High School of Stockholm, 1904. Entered the Royal Engineers as cadet, 1904. Commissioned 1906. Studied mathematics, physics and chemistry, 1906-10, first at The Royal Technological Academy of Stockholm, later at the University of Stockholm. By command of the Swedish Government, studied wireless telegraphy in foreign countries. Author of a number of articles on radio-telegraphy in the scientific and daily press. Member of the Royal Military Association of Stockholm, the Society of Friends of the Swedish National Museum, the Royal Swedish Yacht Club, etc. Knight of the Order of the Crown of Italy. Address: Strändvagen 7, Stockholm.

Todd, David Wooster, Captain U.S. Navy.—B. Round Valley, California, 1874. Educ. private and public schools in Mich., Nev., and San Francisco. Appointed to Naval Academy, 1891, graduated 1895. Served at sea on various vessels of the United States Navy, and in command of the "Pittsburgh" flagship in European waters; has served ashore as instructor in ordnance, Naval Academy; in charge of Radio Division of Bureau of Steam Engineering, Navy Department, and as Assistant Superintendent of the Radio Service. Attended International Radiotelegraphic Conference, London, 1912, as a delegate. Director Naval Communications, 1916. Attended Inter-Allied Radio Conference in Paris upon United States entry into European War, and subsequently organised the American end of the Inter-Allied Transatlantic Radio System. Now in command of the U.S.S. "Nevada," U.S. Battle Fleet.

Travailleur, Maurice.—B. Brussels, 1871. Graduated as engineer at Brussels University,

1893. Appointed Electrical Engineer to the late King of the Belgians, 1897. One of the founders of the Marconi International Marine Communication Co., Ltd., and the Société Anonyme Internationale de Télégraphie sans Fil. Managing Director of the Société Anonyme Internationale de Télégraphie sans Fil, and Chairman of the Agence Télégraphique Belge, both in Brussels.

Tsiang Tseng-yi.—B. in 1877. Native of the Haining District of the Chekiang Province. Acquired the third degree of Literature at the Metropolitan Examination in Peking, 1904, and appointed Junior Clerk of the Board of Revenues. Soon afterwards transferred to the Board of Communications (then known as Yuchuanpu). Proposed that all the commercially and provincially owned telegraph lines be nationalised and completed this work under his personal supervision and placed them under the direct control of the Yuchuanpu, which was the beginning of the unification of the Chinese Telegraph system. In 1911, as Commissioner of Telegraphs of the Yuchuanpu, he caused several powerful radio stations to be established, in Peking, Nankin and other places. He served over ten years in the telegraph service, holding the following positions: 1910-11, Commissioner of Telegraphs of the Yuchuanpu; 1913-16, Chief of the Financial Department of Telegraphs, Posts and Navigation; 1917 to date (1925), Councillor and Chief of the Telegraph Department and Director-General of Telegraphs of the Ministry of Communications, and Chairman of the Chinese Society of Electrical Science. Permanent Address: 22 Chia Ch'ia Hutung, Peking, (South City), China.

Turner, Laurence Beddome, M.A., M.I.E.E.—B. 1886. Educ. Bedford Grammar School and King's College, Cambridge (1904). First-class honours in Mechanical Sciences Tripos in 1907. Spent 1907-8 in research work at the C.U. Engineering Laboratory. After a year in the workshops and drawing office of Messrs. Siemens Bros. at Woolwich and Siemens u. Halske A.G. at Berlin, entered in 1910 the Engineer-in-Chief's office of the G.P.O. Engaged there in W/T experimental and design work. Attached to the Army Signals Experimental Establishment at Woolwich 1916. Fellow (1919) and Assistant-Tutor of King's College, Cambridge. Member of the Imperial Wireless Telegraphy Committee, 1919; and of the Wireless Telegraphy Commission, 1920—. Author of "Outline of Wireless," 1921, and numerous technical papers. Address: King's College, Cambridge.

Vallauri, Giancarlo.—B. Rome, 1882. Entered the Royal Naval Academy. Appointed officer of the Royal Italian Navy, 1903. After a few years at sea quitted the active naval service and joined the Polytechnic School in Naples, obtaining the diploma of engineer and the electro-technic diploma, 1907. Since conducted electrical tuition in the Polytechnic Schools of Padua, Karlsruhe and Naples. Connected with many industrial electric establishments. Inaugurated at the Polytechnic School in Naples a course in Wireless Telegraphy, 1912, and supervised that subject till the end of 1916. Became Director of the Institute of Electricity and Wireless Telegraphy of the Royal Navy, 1918. Is now also Professor of Electrotechnics at the University of Pisa and engaged in supervising the new station of Coltanocentre. His attention has mainly been turned to the study of ferromagnetic phenomena, to which he has made important contributions. Has published a series of papers on Ionic Valves, and on radiation

measurements. Address: R. Accademia Navale, Leghorn, Italy.

Van der Bijl, Dr. H. J.—B. Pretoria, 1887. Educ. Victoria College, South Africa and Universities of Halle and Leipsic, where he gained his doctorate. Visited the United States in 1913, and joined the Engineering Department of the American Telephone and Telegraph Co., and Western Electric Co. Scientific and Technical Adviser to the Government of the Union of South Africa, 1920-23. Appointed Chairman of Electricity Supply Commission of the Union of South Africa, 1923. M.I.R.E., M.I.E.E. (Amer.). Among his inventions is the modulation system used successfully by the American Telephone and Telegraph Company in 1915 for wireless telephone communication over a distance of 5,000 miles. Figured prominently in the development of the Thermionic Vacuum Tube. Author of "The Thermionic Vacuum Tube and its Applications," and numerous publications in scientific and technical journals. Address: P.O. Box 1091, Johannesburg, Union of South Africa.

Van der Pol, Balth, Jun., D.Sc.—B. 1889, at Utrecht. Educ. at Utrecht, graduating as Doctorandus (1916). His interest in the theory and practice of wireless dates from 1904. Came to England in 1916 to study under Professor J. A. Fleming. Proceeded to Cambridge in 1917, working under Professor Sir J. J. Thomson, at the Cavendish Laboratory for about eighteen months. Author of a number of monographs upon physical and radiotelegraphic subjects. Appointed Conservator and placed in charge of the physical research laboratory of Teyler's Institute, Haarlem (Holland). He is one of the founders of the Dutch Radio Institute, of which society he is vice-president. In 1922 was appointed as physicist in the research laboratory of Philips Glowlamp Works (Eindhoven), where he is now in charge of the wireless research. Address: 4, Jan Smits-laan, Eindhoven, Holland.

Vanni, Dr. Giuseppe.—B. at Albano Laziale (Rome), in 1862. Graduated in science 1887. Proceeded to Strassburg University, 1890, where he studied electrical measurements under Prof. F. Kohlrausch. In 1894 he was appointed lecturer of Physics at the Collegio Romano, and in 1912 was elected professor and technical director at the Military Radiotelegraphic Institute in Rome. In 1912, took part in the International Conference of London, as a member of the Italian delegation, and also in the two Conferences of the Hour, held in Paris in 1912 and 1913. His work has been principally concerned with optics, electrical engineering and wireless telegraphy. He made, in 1912, interesting experiments in wireless telephony between Rome and Treviso (420 Km.), and between Rome and Tripoli (1,000 Km.), thus obtaining, at the time, the record for wireless transmission. Is at present Director of the Military Radiotelegraphic Institute, and editor of the "Bollettino Radiotelegrafico del R. Esercito (Radiotelegraphic Army Bulletin), which aims at extending wireless research among the officers of the Italian Army. Address: Rome (49), Military Radiotelegraphic Institute, Viale Mazzini 10.

Vyvyan, R. N.—Educ. Charterhouse. Elect. and Eng. training, Faraday House, 1896-1900. Assistant Engineer Whitehaven, Burton-on-Trent, Portsmouth and Hammersmith. Joined Marconi's Wireless Telegraph Co., 1900. Built Poldhu Wireless Station, subsequently proceeding to Canada as Managing Engineer until 1908. Built Spanish-American chain of stations.

Appointed, in 1910, Superintending Engineer of Marconi's Wireless Telegraph Co. Responsible for design and construction of most of the high-power stations erected by the Marconi Co. Joined R.F.C. 1916, served in France. Later sent to America as member of the British War Mission. Demobilised and returned to Marconi Co. early in 1919 in charge of design construction and management of all wireless stations owned or erected by that company, April 1923. Appointed Engineer-in-Chief of Marconi Co. Address: Windmill Hill House, Hampstead, and Marconi House, Strand, W.C.2.

Weagant, Roy A.—B. Morrisburg, Ontario, Canada, 1881. Educ. Stanstead College, Stanstead, Quebec, and McGill University, Montreal. Graduated from Electrical Engineering Course, 1905. Studied Physics under Sir Ernest Rutherford and became interested in wireless. Gained engineering experience with the Montreal Light, Heat, and Power Company, the Westinghouse Electric Manufacturing Company of Pittsburg, Pa., and the De Laval Steam Turbine Company. Took up commercial wireless work in 1908. Entered service of the Marconi Wireless Telegraph Company of America, 1912, where he soon rose to the position of Chief Engineer. Appointed, 1920, Consulting Engineer, Radio Corporation of America. Member American Institute Electrical Engineers, Fellow of the Institute of Radio Engineers and former member of its Board of Directors and Standardisation Committee. Inventor of a novel method of eliminating static interference. Address: Douglas Manor, Long Island, New York.

Whiddington, Richard, M.A., D.Sc., F.Inst.P. B. 1885, in London. Educ. at St. John's College, Cambridge, where after taking degree in 1908, he undertook research work under Professor Sir J. J. Thomson. Elected Fellow of St. John's College, 1911. In 1914, went to Royal Aircraft Factory, Farnborough, to design wireless apparatus for the Flying Corps. During the war designed a number of the standard R.A.F. wireless sets and assisted on the W/T Board and Inter-Allied W/T Commission in Paris. Demobilised with rank of major, June, 1919. Has published a number of original papers on various electrical subjects. Member of Sub-Committee "D" on Thermionic Valves, of Radio Research Board, of the Department of Scientific and Industrial Research. Professor of Physics, University of Leeds. Address: Leeds University; and 36, Mow Road, Headingley, Leeds.

Wibier, Albert, Lieut.-Col. d'Etat Major.—B. Renaix, 1876. Sent, in 1911, by the King of the Belgians, to install the wireless network in the Belgian Congo. Became Director-General of that service, and for the construction of new wireless services. Organised and controlled the wireless service of the Belgian Army during the late war. President of the Wireless Commission of the Belgian Aero Club, Member of the Comité National Belge de l'Union Internationale de Radiotélégraphie Scientifique. Address: 11, Rue de la Reinette, Brussels, Belgium.

Wilson, Brig.-Gen. Sir Samuel Herbert, K.C.M.G., K.B.E., C.B., C.M.G.—B. 1873. Educ. privately and at R.M. Academy. Entered Army, R.E., 1893. Served S. Africa, 1899-1900. Served great war, 1914-18. Governor and Commander-in-Chief Trinidad and Tobago, 1921. From 1918 to 1921 Principal Assistant Secretary, Committee of Imperial Defence and Head of Imperial External and Defence Branch Cabinet Secretariat. Secretary Imperial Communications Committee; Wireless Tele-

graphy Committee; Officier Legion d'Honneur; French Croix de Guerre; Commandeur de la Couronne, Belgium; Belgian Croix de Guerre. Address: Government House, Trinidad, and Heath Cottage, Puttenham, Surrey.

Wilson, Ernest.—Educ. the Yorkshire College Leeds. Whitworth Scholarship. Apprenticed to Greenwood & Batley, and Siemens Bros. Professor of Electrical Engineering at King's College. Dean of the Faculty of Engineering, King's College. M.I.C.E., M.I.E.E., M. Wireless Soc., London. Fellow of King's College. Contributed various papers read before Royal Society, I.E.E., Royal Society of Arts, etc. Holder of Kelvin Prize of the I.E.E. (1921). Addresses: University of London, King's College, W.C.2., and Savile Club.

Wilson, William Hamilton.—B. 1878. Educ. Collegiate School, Wanganui, New Zealand. Apprenticed to Cable & Co., Marine Engineers, Wellington, N.Z. Electrical and mechanical courses at King's College, Strand, London, 1901 to 1904. Assistant Engineer Metropolitan Electrical Supply Co., Ltd., London, 1904 to 1906. Chief Assistant Electrical Engineer and Acting Electrical Engineer to East Indian Railway Co., Bengal, India, 1906 to 1908. Electrical Engineer to John Birch & Co., Ltd., London, 1910 to 1911. Secretary and Director of the Wilson Apparatus Co., Ltd., Carlisle, 1911 to 1913. In private practice since 1913 as electrical engineer and inventor. Inventor of various wireless telegraph apparatus, X-ray apparatus, and thermo-electric instruments. Designed some of the earliest transformers and apparatus used for army aircraft wireless, etc., before 1912, and transformers, wireless telegraph condensers and transmitting sets used in large numbers during the war. M.I.E.E., M. Röntgen Soc. Joint author of various papers in "The Electrician" on "Measurement of Self Induction, High Tension Discharge Apparatus," etc. Author of paper before Royal Society on "Ruhmkorff Coils." Address: 5-6 Bank Broadway, Kingston Hill, Surrey.

Yokoyama, Eitaro.—B. 1883. Graduated Engineering College of the Tokyo Imperial University, 1908. Entered Ministry of Communications, Japan. Engaged in radio researches at the Electro-technical Laboratory of the Ministry. One of the inventors of T.Y.K. Oscillation Gaps for Radiotelephony. Proceeded to America and Europe to study, 1916. Returned to Japan, 1918, and resumed service at the same Laboratory. Promoted to the Head of the Radio Section of the Laboratory, 1920. M.I.R.E. (America). I.E.E. (Japan). Inst. of Japanese Telephone and Telegraph Engineers. Private Address: Kiharayama 162, Omori, Tokyo.

Zenneck, Professor, Dr. J.—B. 1871, in Württemberg. Studied at Tübingen. Obtained his doctorate, 1894. Studied natural history in London and elsewhere. Subsequently devoted himself entirely to physics. Assistant in the Physical Institute in Strassburg, 1895-99. Engaged in making tests with wireless telegraphy in the North Sea, 1899-1900. Assistant Professor of Physics in the Institute of Technology, Dantzic, 1905. Professor of Physics at the Institute of Technology, Brunswick, 1906. Professor of Physics at the Institute of Technology, Dantzic, 1911, Munich, 1913. During part of the war Technical Adviser to the Atlantic Communication Co., which then operated Sayville wireless station. Member of Bavarian Academy of Sciences. Fellow of the Institute of Radio Engineers. Address: Technische Hochschule, München (Germany).

OBITUARY.

AMONG those whom death has claimed since the last edition of the **YEAR BOOK** went to press, are five whose names were closely associated with the development of wireless.

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DR. FRANCISCO BHERING, who died in Paris on April 13th, 1924, was Director-General of Telegraphs in Brazil. Born at Uberaba, Minas Geraes, in 1867, his life was devoted to the advancement of geographic and telegraphic knowledge in Brazil. Under his initiation and direction the survey and mapping of Brazil was undertaken. He was Professor of Geodesy and Astronomy in the Rio de Janeiro Polytechnic School, and Director of the Technical Branch of the Telegraph Administration. He also represented Brazil at the International Radiotelegraphic Conference in London in 1912, and was the author of numerous works on civil engineering, geography and telegraphy.

M. ALFRED DENNERY, Director of the Ecole Superieure des Postes et Telegraphes, who died in Paris on November 2nd, 1923, was born at Marckolsheim in 1871. His career was intimately connected with the growth of wireless telegraphy in France, and he was for several years director of the Office of the Ministry of Posts and Telegraphs. He was a Commander of the Legion of Honour.

DR. OLIVER HEAVISIDE, F.R.S., whose recent death at Torquay on February 4th, 1925, is fresh in the memory of all wireless engineers, will probably be remembered by them chiefly on account of his theory of a permanently ionised layer in the upper atmosphere now so well known as the "Heaviside Layer." He was born in London on May 13th, 1850, and devoted his life to the study of electro-magnetic problems. He was Faraday medallist of the Institution of Electrical Engineers, Honorary Ph.D. of Gottingen, and an honorary member of the American Academy of Arts and Sciences.

MR. JOHN ST. VINCENT PLETTS, who died from heart attack on April 26th, 1924, was born in the Isle of Wight in 1880, and joined the staff of Marconi's Wireless Telegraph Co., Ltd., in 1899. He was responsible for the erection of wireless stations in Hawaii, Labrador, the Congo, and the Far East, and later became Head of the Patent Department of the Company. Since 1919 he had been in practice as an independent consulting engineer.

MR. WILLIAM WALTER BRADFELD, C.B.E., the news of whose death reached us while going to Press, was intimately associated with Senatore Marconi's early work and with the progress of the Marconi Companies. A short summary of his career will be found in the preceding Biographical Notices and it is with deep regret that we have to record his death on 17th March.

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LITERATURE OF WIRELESS TELEGRAPHY AND TELEPHONY

BRITISH

NEW PUBLICATIONS, 1924.

The Home Radio. A. Hyatt Verrill. Rev. ed., including 1924 developments. 12 mo., $7 \times 4\frac{1}{2}$, pp. 162. 2s. 6d. net. *Harpers*, November, 1924.

Radio Press Wireless Panel Transfers. Envelope. 6d. net. *Radio Press*, November, 1924.

Radio Research Board. Special Report, 2. Variations of apparent bearings of radio transmitting stations. Part I. Observations on fixed stations, 1921-22. 3s. 6d. net. *H.M.S.O.*, December, 1924.

Wireless Telegraphy and Telephony and How to Make the Apparatus. E. Redpath. New ed., 87 illus., cr. 8vo, $7\frac{1}{2} \times 5$, pp. 156, swd. 1s. 6d. net. *Cassell*, February, 1924.

Radio-Valves and How to Use Them. John Scott-Taggart. Illus. Cr. 8vo, $8\frac{1}{2} \times 5\frac{1}{2}$, pp. 112, bds. 2s. 6d. net. *Radio Press*, January, 1924.

Radio Year Book, 1924. A book of reference for all interested in broadcast receiving. With contributions by J. A. Fleming and others (2nd year). 4th ed. Cr. 8vo, $7\frac{1}{2} \times 5$, pp. 208, swd. 1s. 6d. net. *Pitman*, January 1924.

Wireless. P. J. Risdon. Intro. by J. A. Fleming. With diags. and illus. 8vo, $8\frac{1}{2} \times 6$, pp. 384. 6s. net. *Ward, Lock*, November, 1924.

The All-Concert de Luxe Receiver: How to make a handsome three-valve cabinet set for use with telephones or loud speakers. Percy W. Harris. Envelope size. 10×12 . 2s. 6d. net (Radio Press Envelope No. 4). *Radio Press*, June, 1924.

The Construction of Amateur Valve Stations. Alan L. M. Douglas. 2nd rev. ed. Cr. 8vo, $7\frac{1}{2} \times 5$, pp. 99, swd. 1s. 6d. net. *Wireless Press*, January, 1924.

How to Make Wireless Amplifiers. Complete instructions for making one-valve H.F. and L.F. wireless amplifiers, with full wiring diagrams. A. V. Ballhatchet. With 22 illus. Fcap. 8vo, $6\frac{1}{2} \times 4$, pp. 40, swd. 6d. net. *P. Marshall*, May, 1924.

The Boy's Book of Wireless. Ernest H. Robinson. Illus. and working diagrams. Cr. 8vo, $7\frac{3}{4} \times 5$, pp. 254. 5s. net (Modern Boy's Library). *Cassell*, April, 1924.

The Broadcasting Time-table and Reception Log: with notes on reception, maintenance of equipment, etc. Ronald Grierson. Folio, 8×13 , pp. 24, swd. 2s. 6d. net. *Chapman & Hall*, December, 1924.

The Amateur's Book of Wireless Circuits. F. H. Haynes. Repr. Roy. 8vo, $10 \times 6\frac{1}{4}$, pp. 124. 3s. 6d. net. *Wireless Press*, September, 1924.

Crystals and Crystal Detectors: Practical Instruction on Selection, Testing, Mounting, and Adjustment of Mineral Rectifiers. With 21 illus. Fcap. 8vo, $6\frac{1}{2} \times 4$, pp. 44, swd. 6d. net. *P. Marshall*, May, 1924.

Crystal Sets: Construction and Maintenance. E. T. Larnier. 12mo, $7\frac{1}{4} \times 4\frac{3}{4}$, pp. 62, swd. 9d. net. *A. Rogers*, November, 1924.

How to Make a Family Four-Valve Receiver, for use with Telephones or Loud Speaker. 2s. 6d. net (Radio Press Envelope, No. 2). *Radio Press*, February, 1924.

Wireless for All: A Simple Explanation of Wireless for the General Public. John Scott-Taggart. 8vo, $8\frac{1}{2} \times 5\frac{1}{2}$, pp. 64, swd. 9d. *Radio Press*, March, 1924.

The Four-valve Combination Receiver. W. James. Roy. 8vo, $10\frac{3}{4} \times 6\frac{1}{4}$, pp. 8, swd. 2s. net (W.P. Ezi-Wiring Series). *Wireless Press*, November, 1924.

The Calculation and Measurement of Inductance and Capacity. W. H. Nottage. 2nd ed. rev. 8vo, $8\frac{1}{2} \times 5\frac{1}{2}$, pp. 232. 7s. 6d. net. *Wireless Press*, July, 1924.

Wireless Possibilities. A. M. Low. With 4 diagrams. Fcap 8vo, $6\frac{1}{2} \times 4\frac{1}{2}$, pp. 77. 2s. 6d. *K. Paul*, June, 1924.

A Practical Guide to Wireless in Simple Language, telling the Beginner everything necessary for Broadcast Reception. Bernard E. Jones. Illus. 8vo., $8\frac{1}{2} \times 5\frac{1}{2}$, pp. 70, swd. 1s. net. *Cassell*, June, 1924.

Wireless Sets for Home Constructors. E. Redpath. Cr. 8vo, $7\frac{1}{2} \times 5$, pp. 129, swd. 2s. 6d. net. *Radio Press*, March, 1924.

The "Simplicity" 3-Valve Set: How to Build and Work It. G. P. Kendall. Envelope size, $9\frac{1}{4} \times 12$. 2s. 6d. net (Radio Press Envelope, No. 3). *Radio Press*, June, 1924.

An Efficient Single-valve Set and How to Build It. H. K. Simpson. Folio, 10×12 . 1s. 6d. net (Radio Press Envelope). *Radio Press*, November, 1924.

Wireless Telegraphy Committee (Imperial) Report. 1924. 1s. net. *H.M.S.O.*, February, 1924.

Year-Book of Wireless Telegraphy and Telephony, 1924. Cr. 8vo, $8\frac{1}{4} \times 5\frac{1}{4}$, pp. 986. 15s. net. *Wireless Press*, April, 1924.

The Wireless Telephone: What It Is and How It Works. 2nd ed., rev. 12mo, $7\frac{1}{4} \times 4\frac{3}{4}$, pp. 120, swd. 2s. net. *Wireless Press*, October, 1924.

The ABC of Wireless Television. A. J. Bohringer. Fcap 8vo., $6\frac{1}{2} \times 4\frac{1}{4}$, pp. 39, swd. 9d. net. *Taunton Bros.*, June, 1924.

Thermionic Tubes in Radio Telegraphy and Telephony. John Scott-Taggart. Illus., repr. 8vo, $8\frac{3}{4} \times 5\frac{1}{2}$, pp. 494. 15s. net. *Wireless Press*, July, 1924.

The Thermionic Valve and its Developments in Radio-Telegraphy and Telephony. Illus., 2nd ed. rev. 8vo, $8\frac{3}{4} \times 5\frac{1}{2}$, pp. 452. 15s. net. *Wireless Press*, July, 1924.

A Three-Valve Portable Receiver. Hugh S. Pocock. Illus., roy. 8vo, $10\frac{3}{4} \times 6\frac{1}{2}$, pp. 8, swd. 2s. net (W.P. Ezi-Wiring Series). *Wireless Press*, September, 1924.

Tuning Coils and How to Wind Them. G. P. Kendall. Cr. 8vo, $7\frac{3}{4} \times 5$, pp. 68, swd. 1s. 6d. net. *Radio Press*, February, 1924.

The Construction of a Two-valve and Crystal Reflex Receiver. W. James. Illus. Roy. 8vo, $10\frac{3}{4} \times 6\frac{1}{4}$, pp. 8, swd. 2s. net (W.P. Ezi-Wiring Series). *Wireless Press*, September, 1924.

Wireless Valve Transmitters: the Design and Operation of Small Power Apparatus. W. James. Illus., 8vo, $8\frac{3}{4} \times 5\frac{1}{2}$, pp. 279. 9s. net. *Wireless Press*, October, 1924.

How to Make the W.I. Three-valve Cabinet Set. H. K. Simpson. Envelope size. $8\frac{1}{4} \times 12\frac{1}{4}$. 1s. net (Radio Press Panel Card, No. 1). *Radio Press*, June, 1924.

- Wireless World Directory of Experimental Transmitting Stations and Regular Transmissions.** 8vo, $8\frac{1}{2} \times 5\frac{1}{2}$, pp. 40, swd. 1s. net. *Wireless Press*, July, 1924.
- Uncle Jack Frost's Wireless Yarns on Good Reception and How to Get It.** Capt. C. C. J. Frost. With port., 12 mo., $7\frac{1}{4} \times 4\frac{3}{4}$, pp. 108, swd. 2s. net. *Wireless Press*, September, 1924.
- Your First Steps in Wireless.** Hugh S. Pocock. Illus., 12mo, $7\frac{1}{4} \times 4\frac{3}{4}$, pp. 60, swd. 9d. net. *Wireless Press*, November, 1924.
- Captain Eckersley Explains: a Reply to his Numerous Correspondents.** Capt. P. P. Eckersley. Illus. 12mo, $7\frac{1}{4} \times 4\frac{3}{4}$, pp. 94, swd. 2s. net. *Wireless Press*, October, 1924.
- Home Constructor's Easy-to-Build Wireless Sets.** F. H. Haynes. 1s. 6d. net. *Iliffe & Sons, Ltd.*
- Tuning Coils and Methods of Tuning.** W. James. 2s. 6d. net. *Iliffe & Sons, Ltd.*
- Wireless Receivers and Circuits in Principles and Practice.** R. D. Bangay. 2s. 6d. net. *Iliffe & Sons, Ltd.*
- Wireless Annual for Amateurs and Experimenters, 1925.** 2s. 6d. net. *Wireless Press*, December, 1924.
- Wireless Trader Year-book and Diary (1925).** First year of publication. 5s. net. *Watergate Press*, January, 1925.

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- La Télégraphie sans fil, ses Applications en Temps de Paix et Pendant la Guerre.** Julien Verdier. Paris: *Librairie Gauthier Villar*. 35 frs.
- La Pratique Radioélectrique, tours de mains et recettes.** P. Hemardinquer. Paris: *Librairie Masson*. 9 frs.
- Radiotélégraphie et Radiotéléphonie.** P. de Jussieu. Paris: *Librairie Dunod*. 12 frs.
- Montages à Transformations.** P. Hémardinquer. Paris: *Bibliothèque de Radioélectricité*, 63 Rue Beaubourg. 3.50 frs.
- Eléments de Radioélectricité, Encyclopédie.** Paris: *Bibliothèque de Radioélectricité*, 63 rue Beaubourg. 5 frs.
- Radiotélégraphie Pratique et Radiotéléphonie.** P. Maurer. Paris: *Librairie Dunod*. 38 frs.
- Cours Pratique d'Electricité Industrielle.** Léon Bouthillon. Paris: *Bibliothèque de Radioélectricité*, 63 rue Beaubourg. 10 frs.
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- Les Montages Modernes en Radiophonie,** sous presse. P. Hémardinquer. Paris: *Bibliothèque de Radioélectricité*, 63 rue Beaubourg, 2 volumes.
- Les Alternateurs à Haute Fréquence,** sous presse. J. Bethenod. Paris: *Bibliothèque de Radioélectricité*, 63 rue Beaubourg.
- La Radiophonie en Belgique.** Raymond Braillard. Paris: *Librairie Desforges*.
- Cent Problèmes Pratiques de T.S.F.** P. Hémardinquer. Paris: *Librairie Masson*. 6 frs.
- Le Superhétérodyne.** M. Dupont. Paris: *Etablissements Radio L.L.* 5 frs.
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DUTCH PUBLICATIONS

BOOKS PUBLISHED DURING 1924.

- Het Draadloos Amateurstation.** J. Corver. The Hague: *Veenstra*. f. 3.75.
- Het Draadloos Zendstation voor den Amateur.** J. Corver. The Hague: *Veenstra*. f. 3.75.
- Hoe kan ik Draadlooze Telefonie Ontvangen?** J. Corver. f. 0.75.
- Fouten in Ontvangtoestellen en Oorzaken van Storingen.** J. J. Numans. The Hague: *Veenstra*. f. 0.90.
- Handleiding voor de Uitoefening van den Radio-Telegraafdienst. Bepalingen and Voorschriften.** W. Kruyt. Flushing: *v. d. Velde*. f. 2.25.
- Radiotelegrafie in de Tropen.** Dr. C. J. de Groot. The Hague: *Veenstra*. f. 7.50.
- Leerboek voor a.s. Radiotelegrafisten en Stuurlieden.** Part I and II. L. F. Steehouwer. Gorinchem: *Noorduyn*. f. 7.70.
- Wat is Radio?** J. C. Nonnekens. Amsterdam: *Engers & Faber*. f. 0.15.
- De Theoretische Grondslagen van Magnetisme en Electriciteit.** Dr. Ir. N. Koomans. The Hague: *Veenstra*. f. 3.50.
- Leiddraad voor het Zelfvervaardigen van Draadlooze Toestellen.** Ir. M. Polak. Amsterdam: *Ned. Persbureau Radio*. f. 1.75.
- En Zendschema's voor den Radio Amateur.** Ir. M. Polak-Ontvang. Amsterdam: *Ned. Persbureau Radio*. f. 1.75.
- Draadlooze Telegrafie.** Dr. C. de Jong. Amsterdam: *My. voor Goede & Goedkoop Lectuur*. f. 3.25.
- Technische Handleiding voor Adspirant Radiotelegrafisten.** A. K. Damstra & A. Walrave. Flushing: *v. d. Velde*. f. 4.00.
- Vragen en Antwoorden over Radiotelegrafie.** G. Emmerik. The Hague: *Veenstra*. f. 2.50.
- De Grondslagen der Radiotelegrafie.** J. C. Nonnekens. Rotterdam: *Nygh & van Diltmar*. f. 2.50.
- Wisselstroomtheorie.** Dr. Ir. N. Koomans. The Hague: *Veenstra*. f. 3.50.
- Draadlooze Telegrafie & Telefonie voor Isdereen** (out of print). G. Magnée. Amsterdam: *Ned. Persbureau Radio*. f. 0.75.

PERIODICALS.

- Radio Nieuws** (monthly). *Per annum*, f. 8. *Abroad*, f. 10. The Hague: *Veenstra*.
- Radio Express** (weekly). *Six months*, f. 3. *Abroad*, f. 5. The Hague: *Veenstra*.
- Radio Wereld** (weekly). *Per annum*, f. 7.50. *Abroad*, f. 10. Amsterdam: *Engers & Faber*.
- Electra** (weekly). *Per annum*, f. 1.50. The Hague: *Levisson*.
- Electro-Radio** (fortnightly). *Six months*, f. 2. The Hague: *Levisson*.
- Christelyk Tijdschrift voor Radio** (weekly). *Three months*, f. 1. Maassluis: *Ned. Christelyce Radio-Vereeniging*.
- Radio Luistergids** (weekly). *Per annum*, f. 6. Amsterdam: *Jacob van Campen*.

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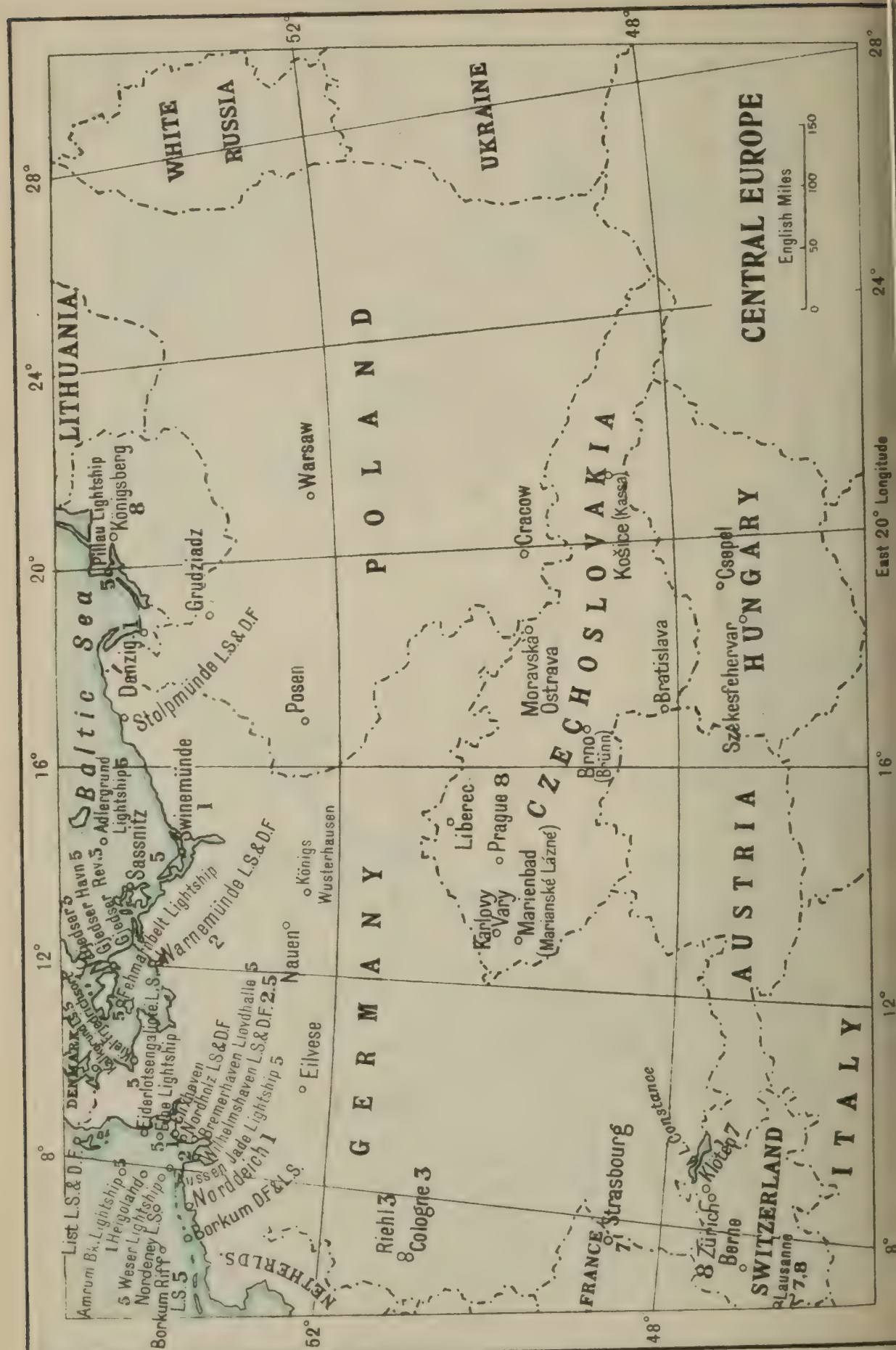


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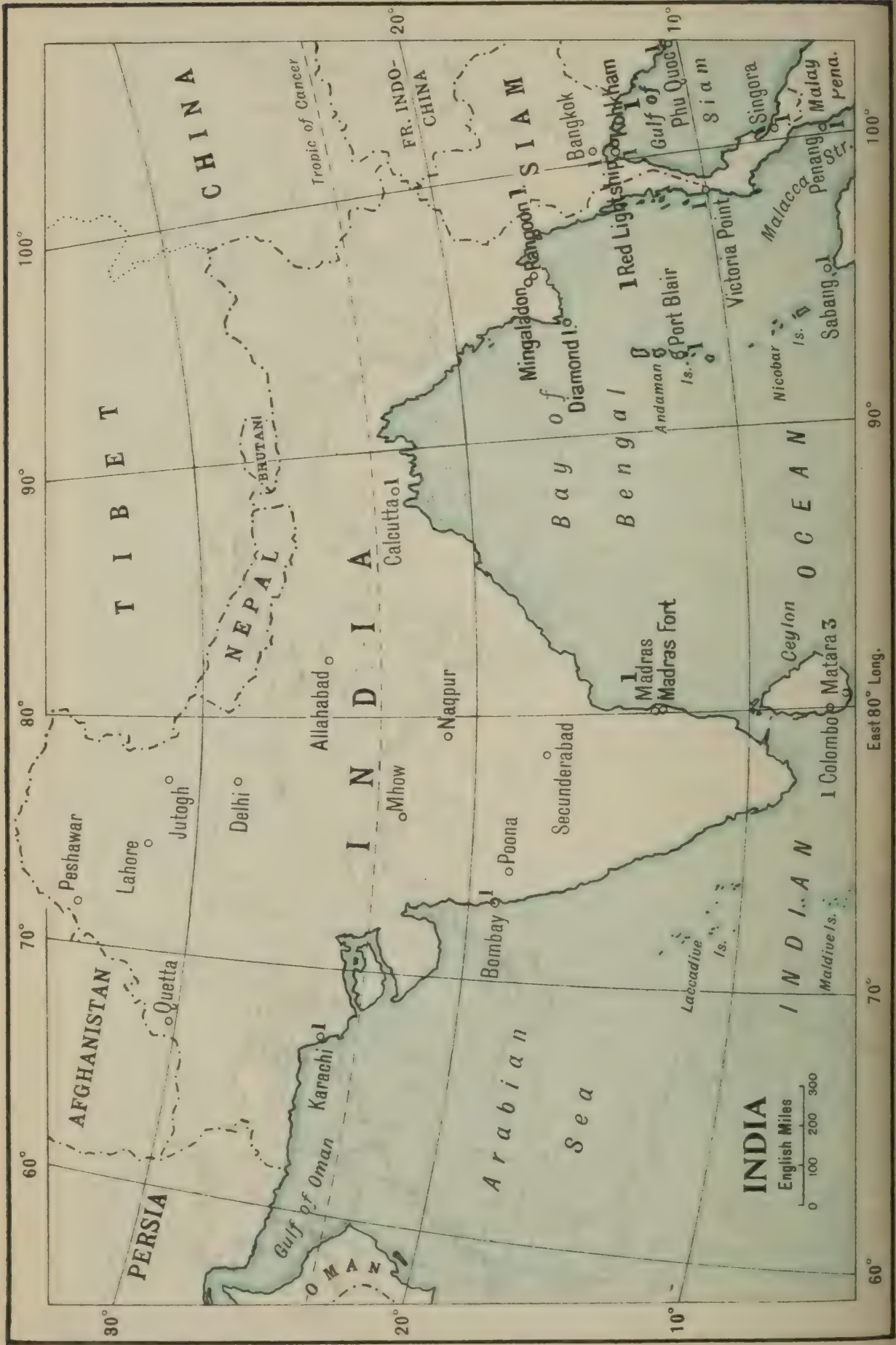




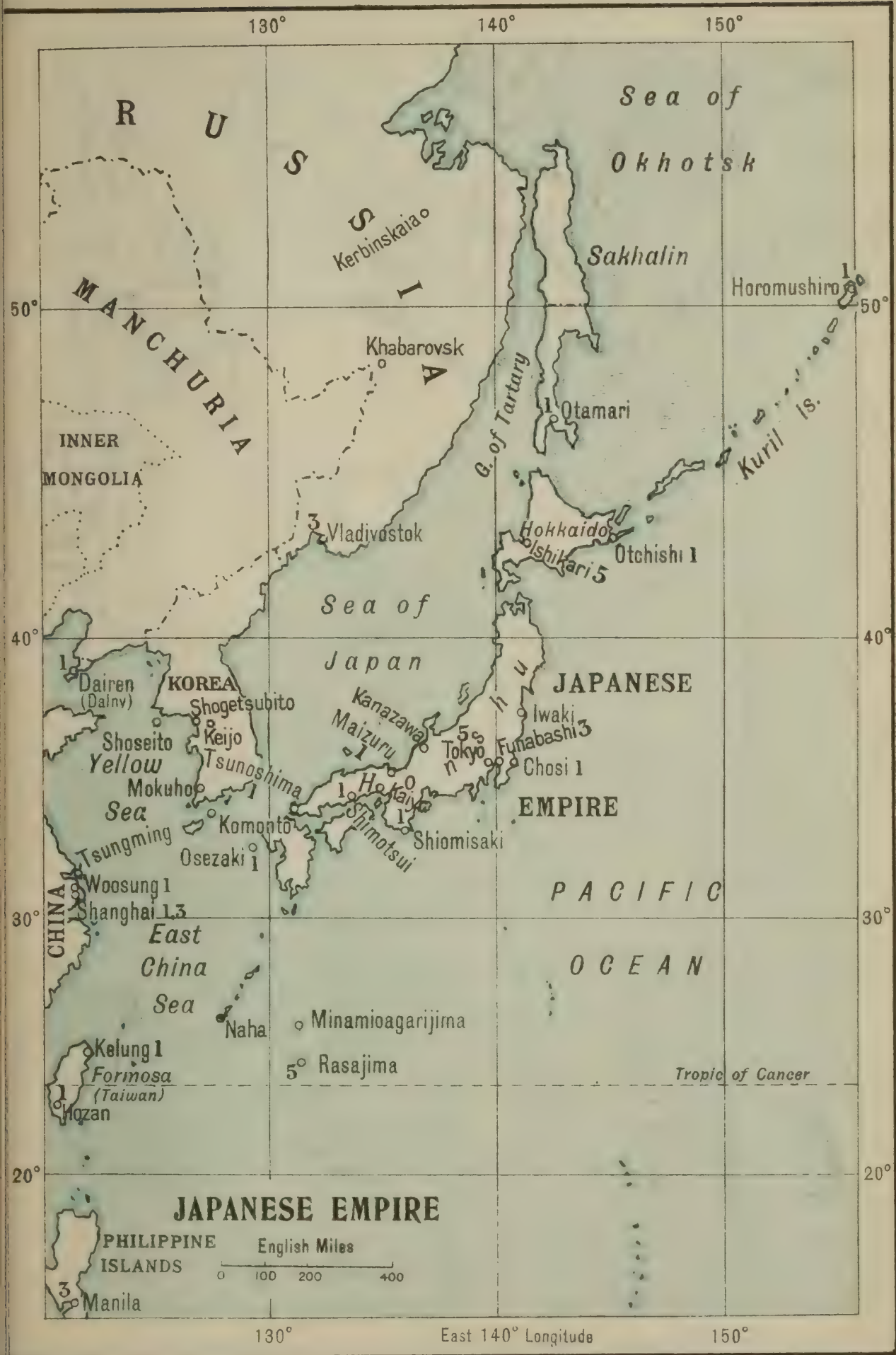
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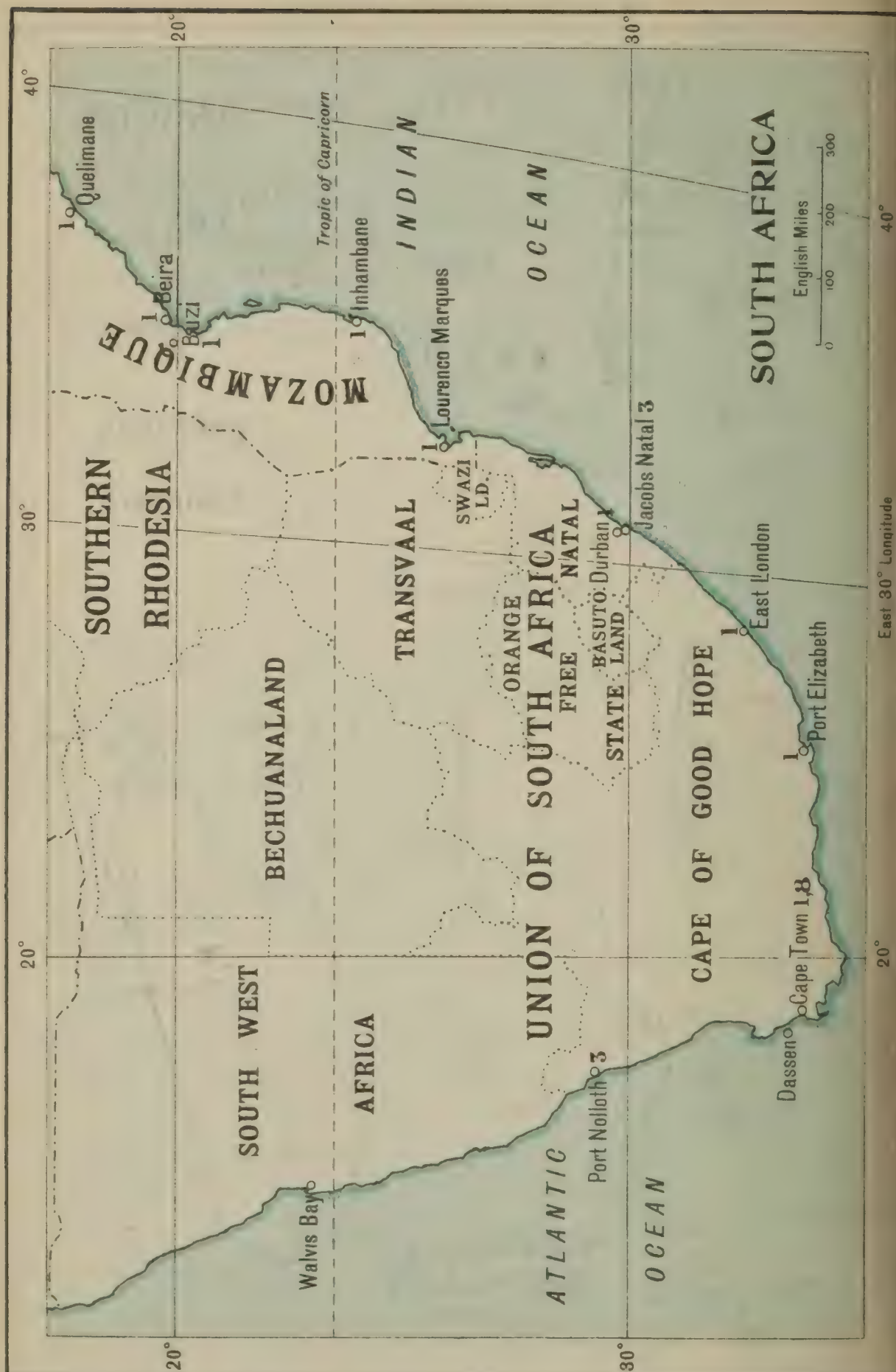




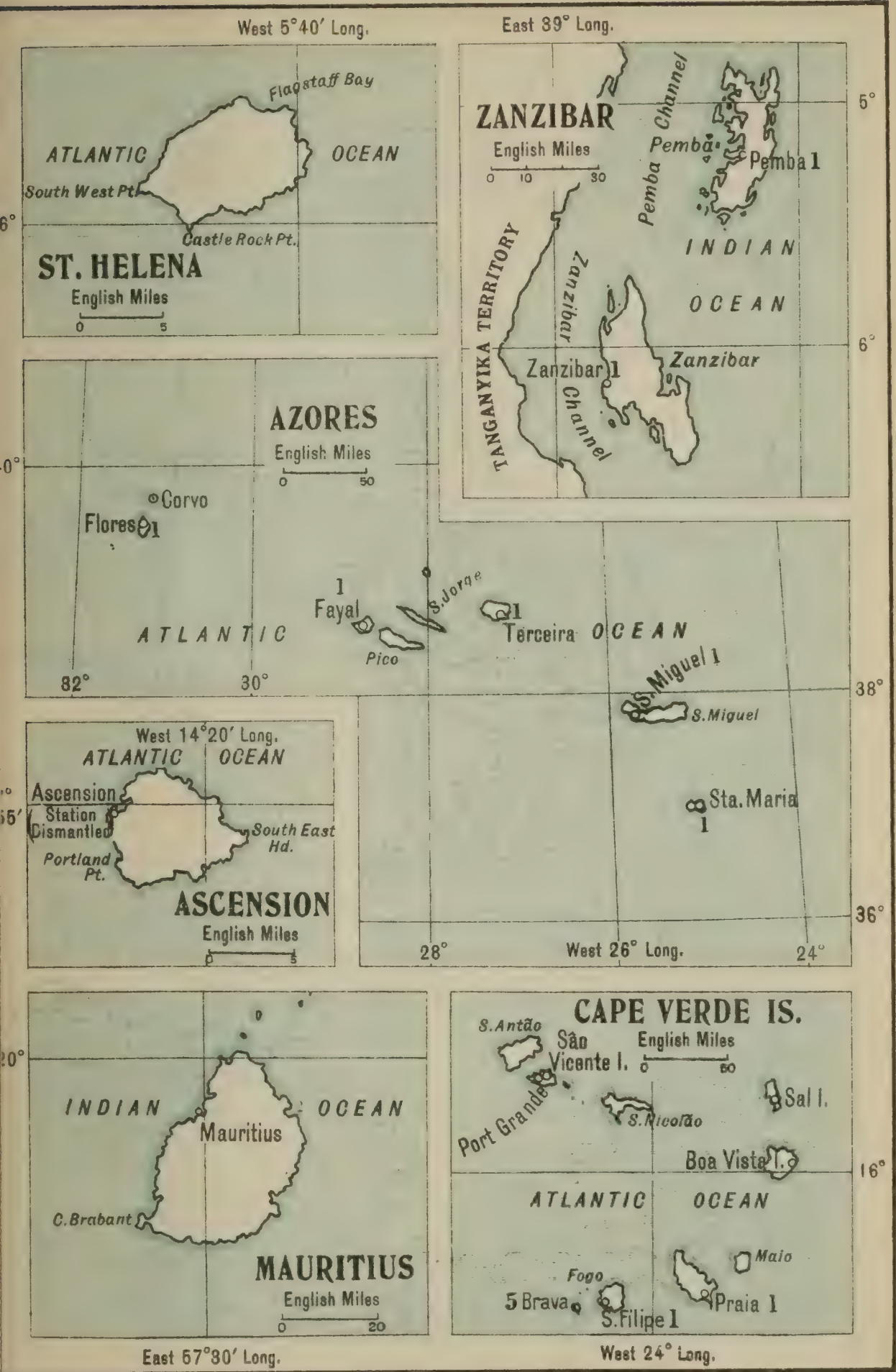
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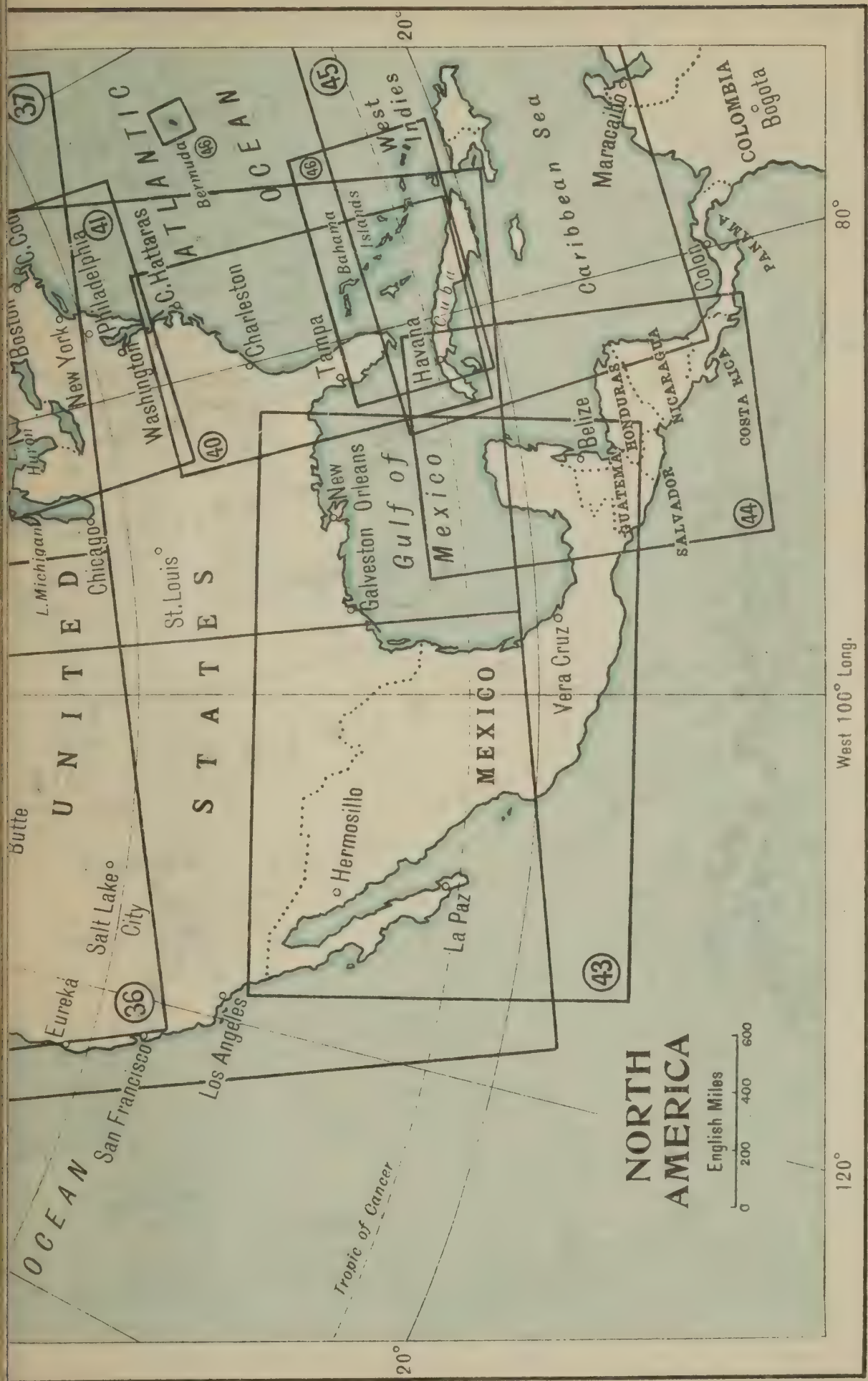
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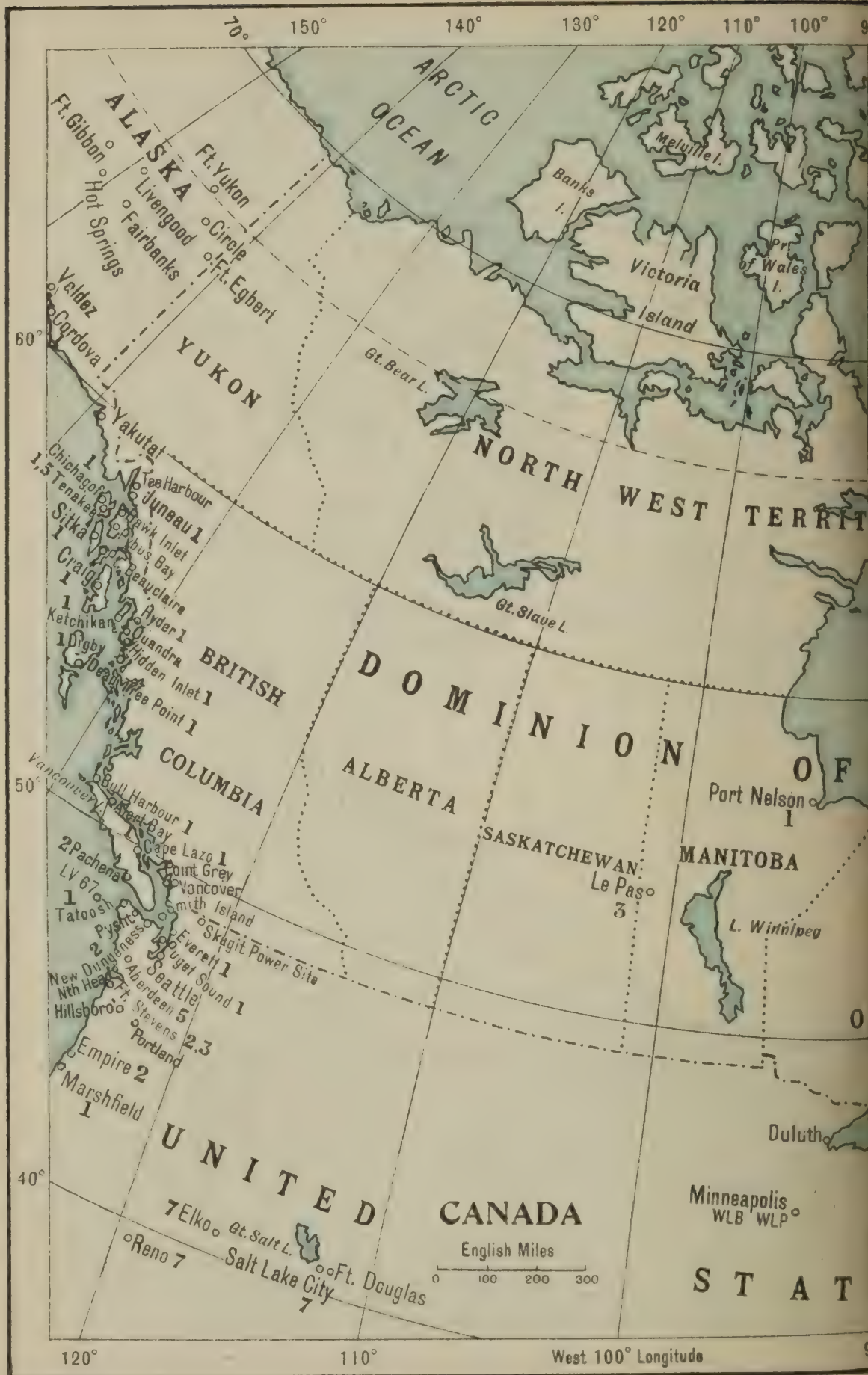


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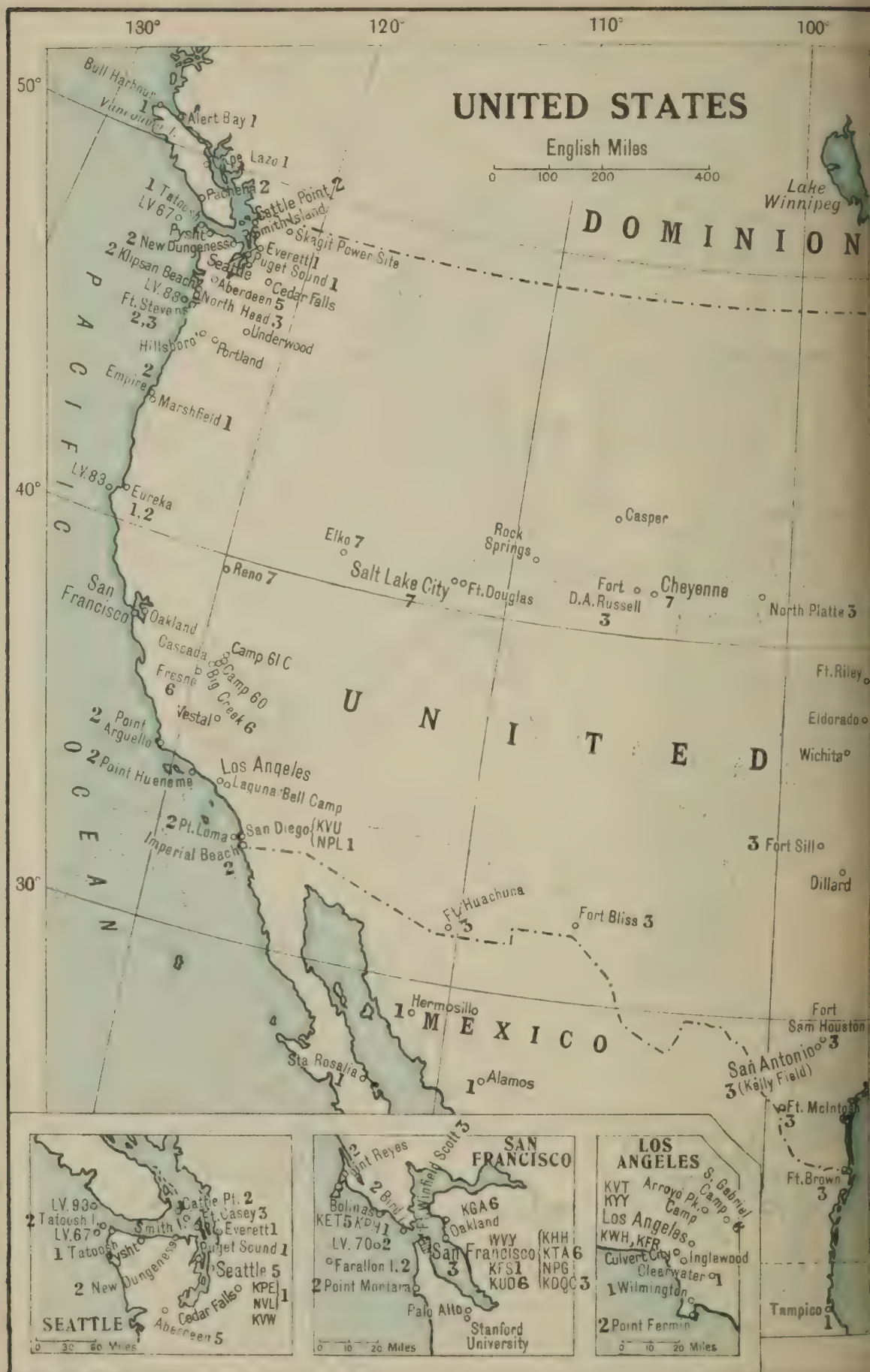


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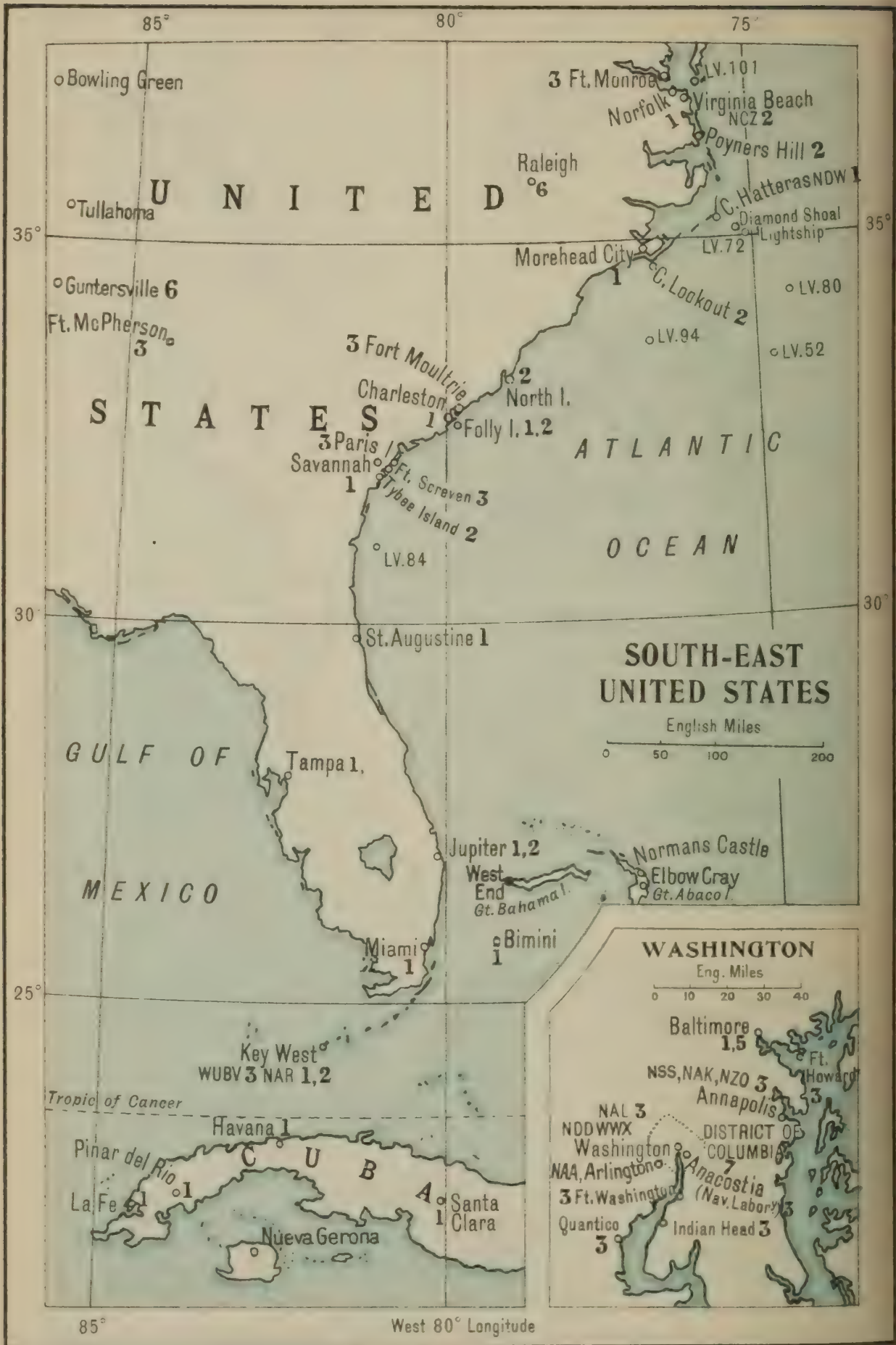


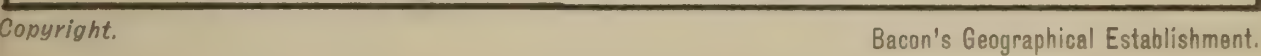




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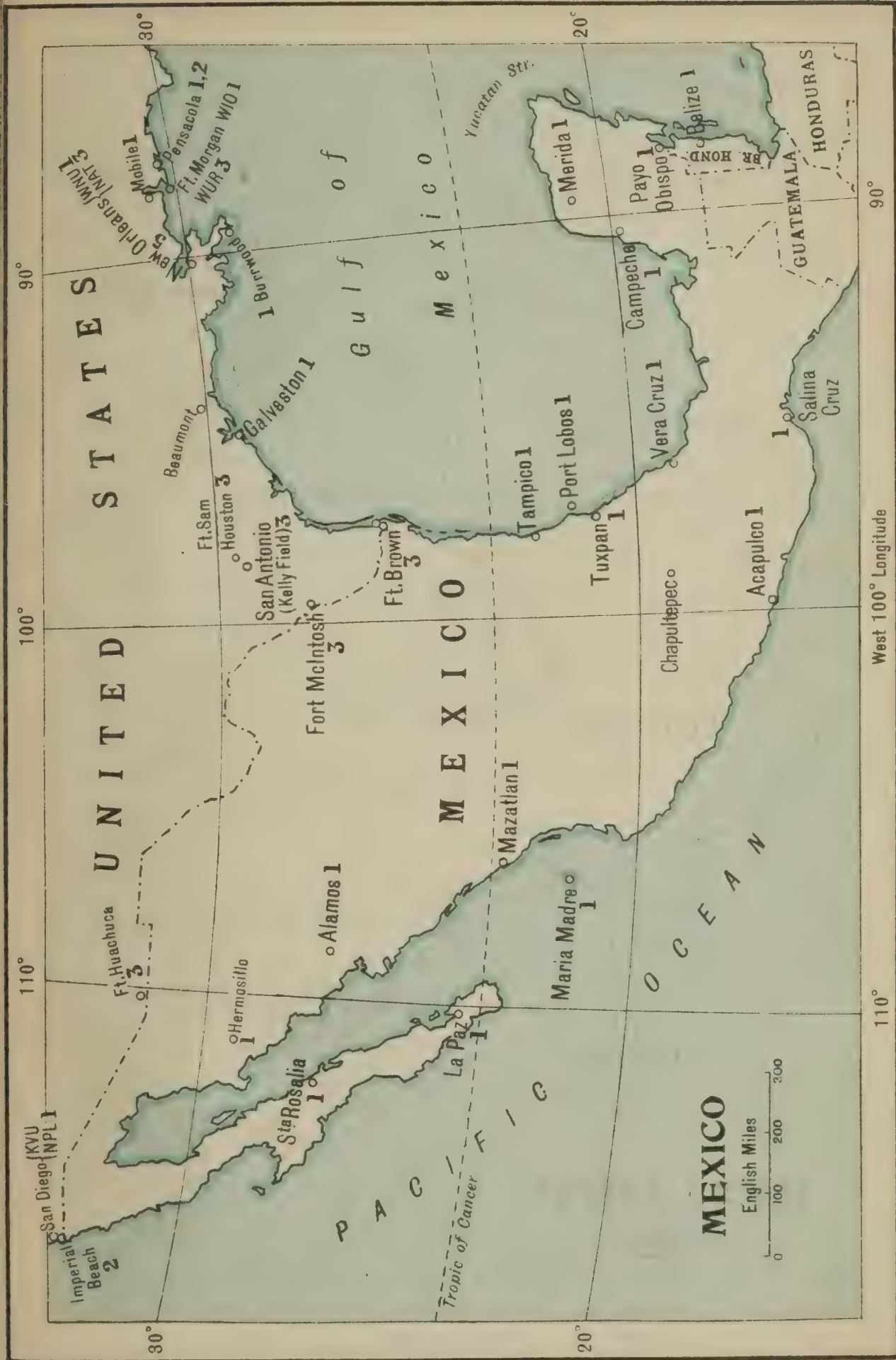




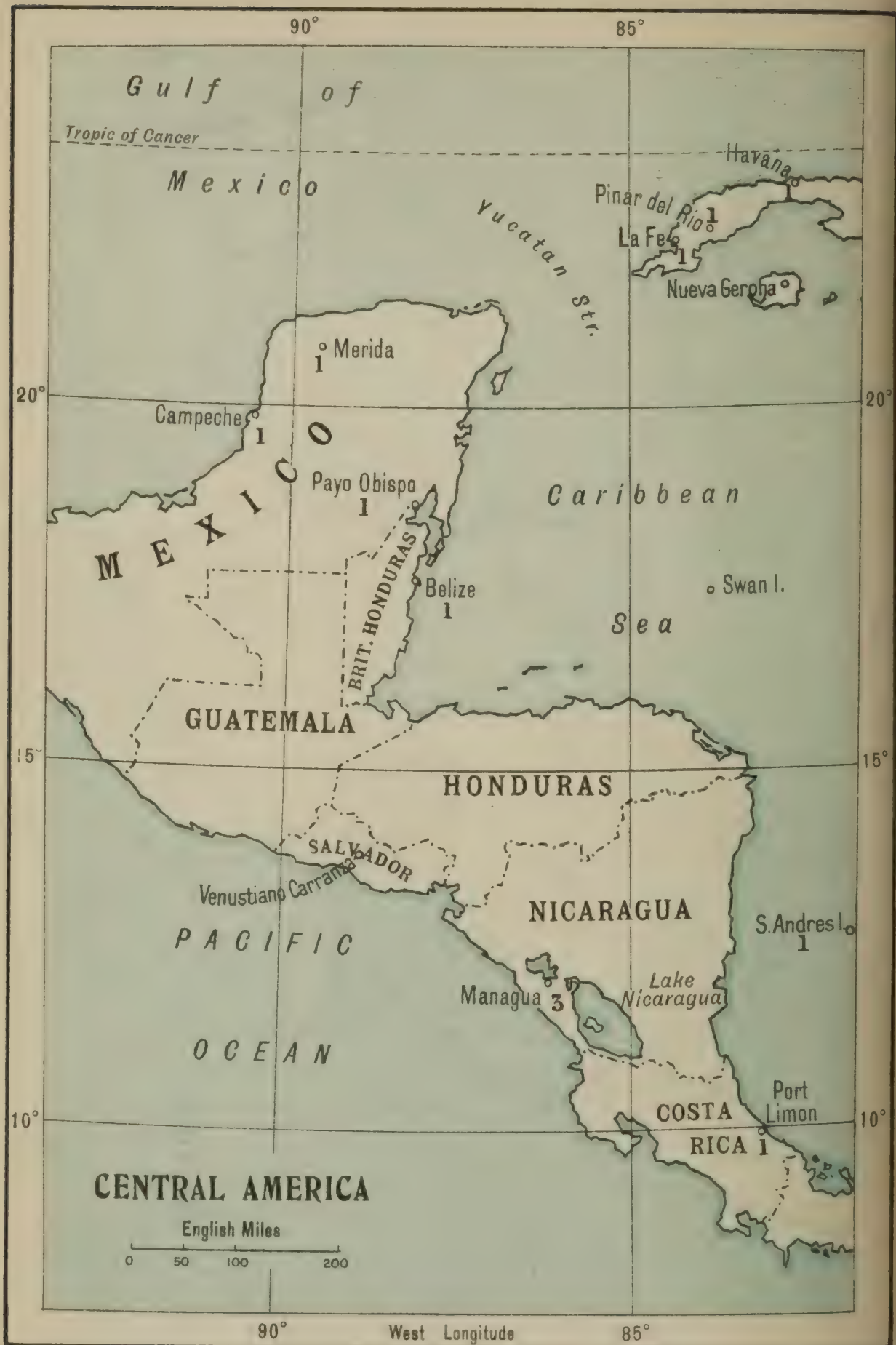




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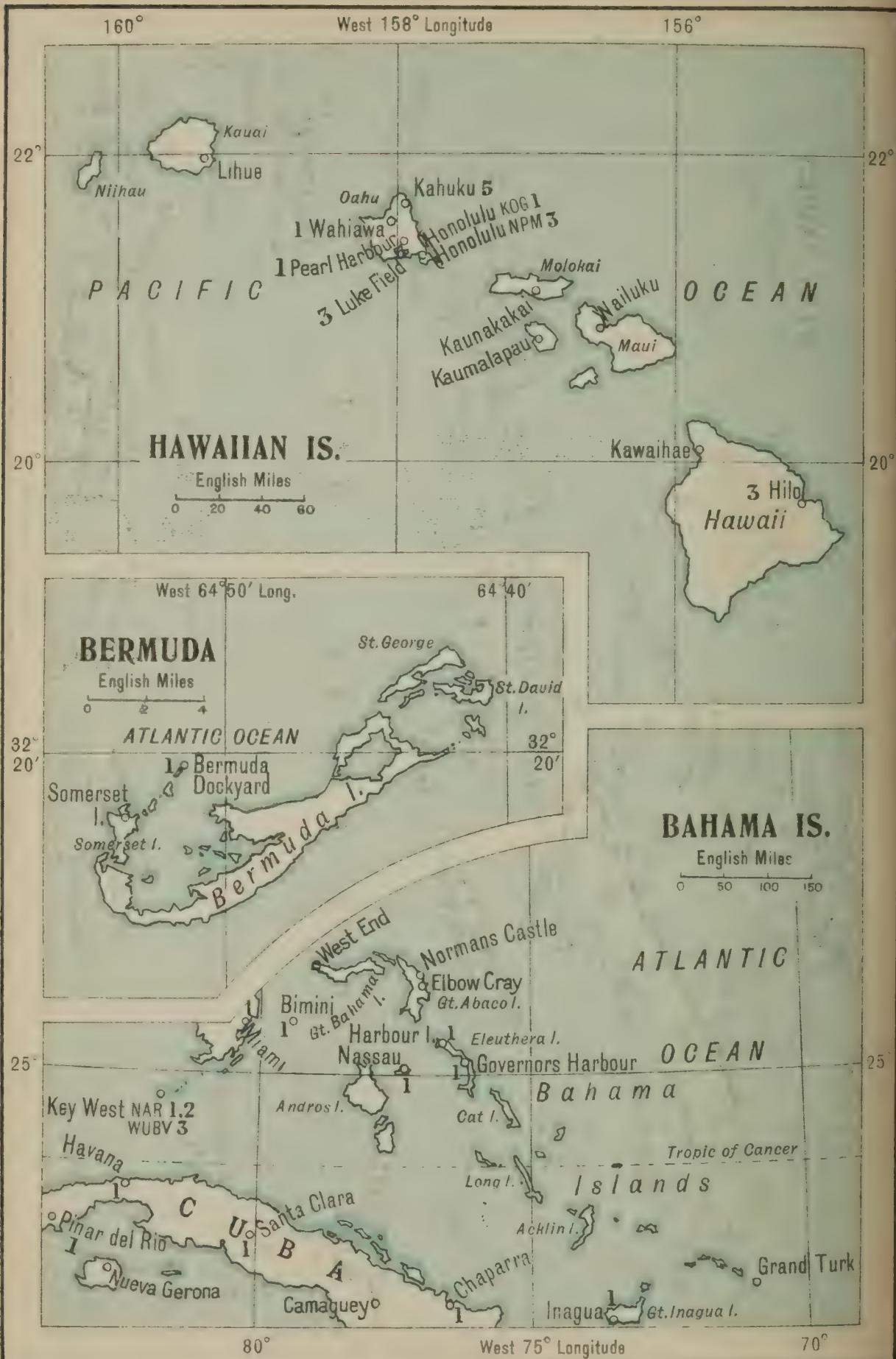


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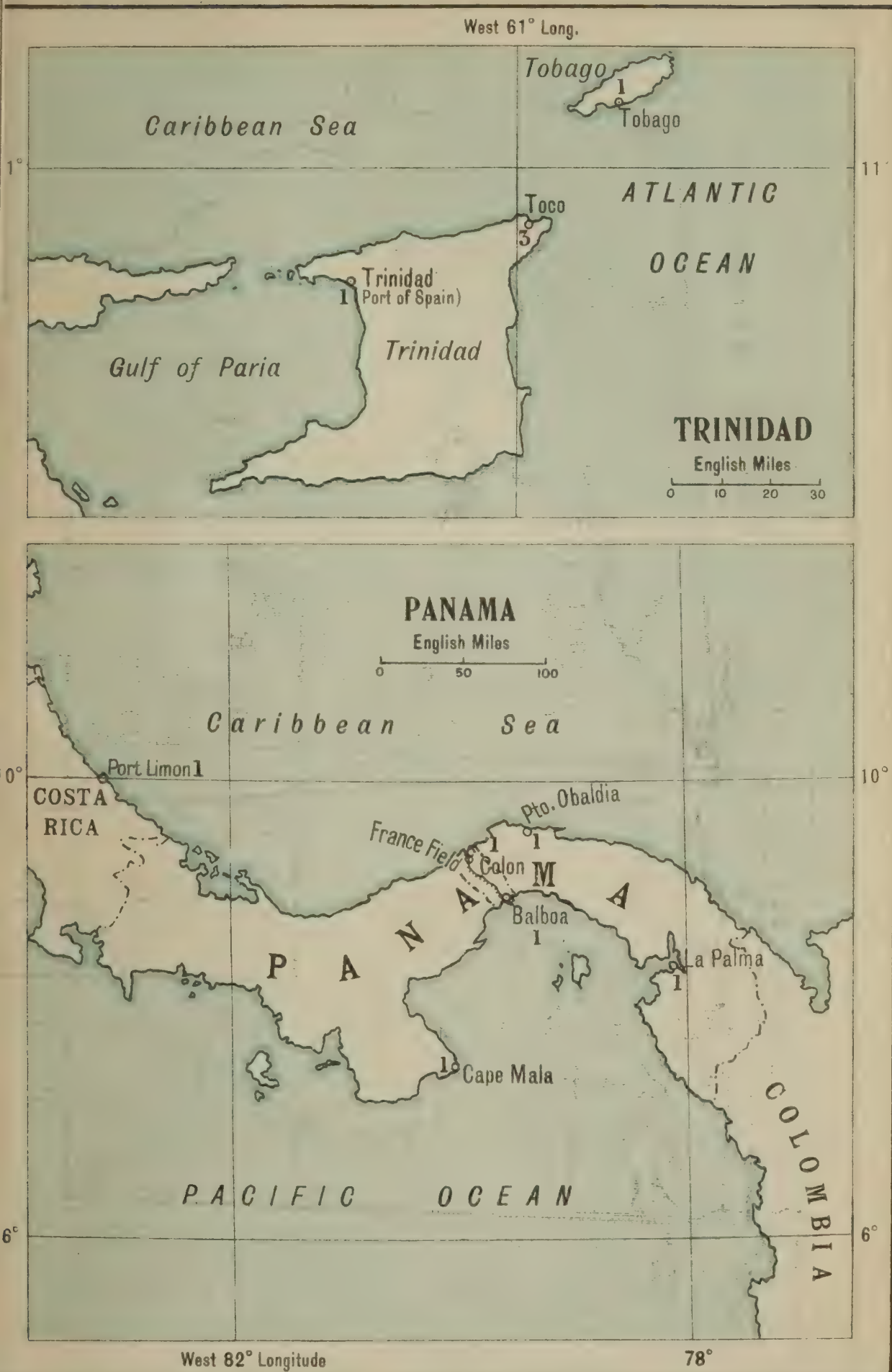


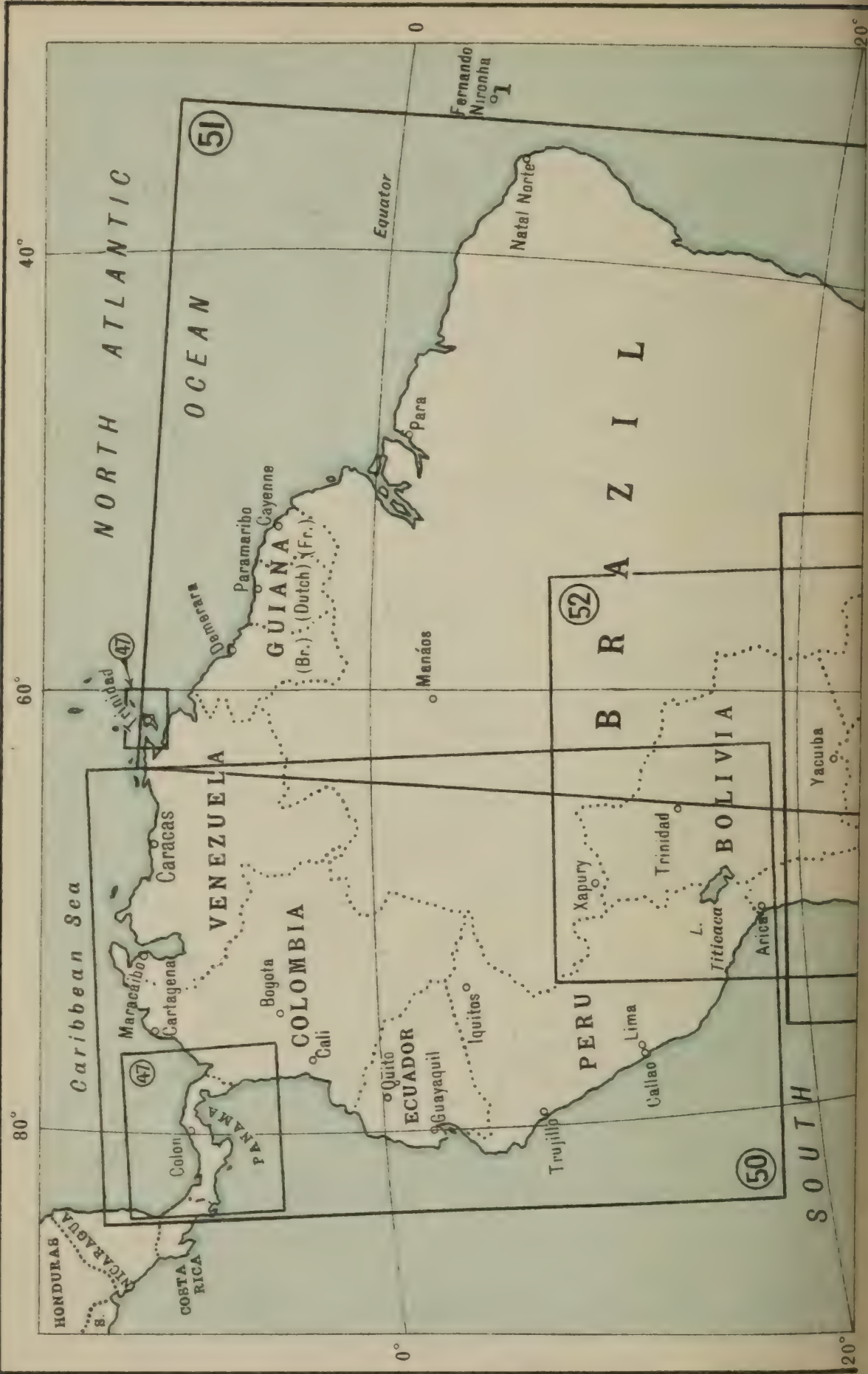


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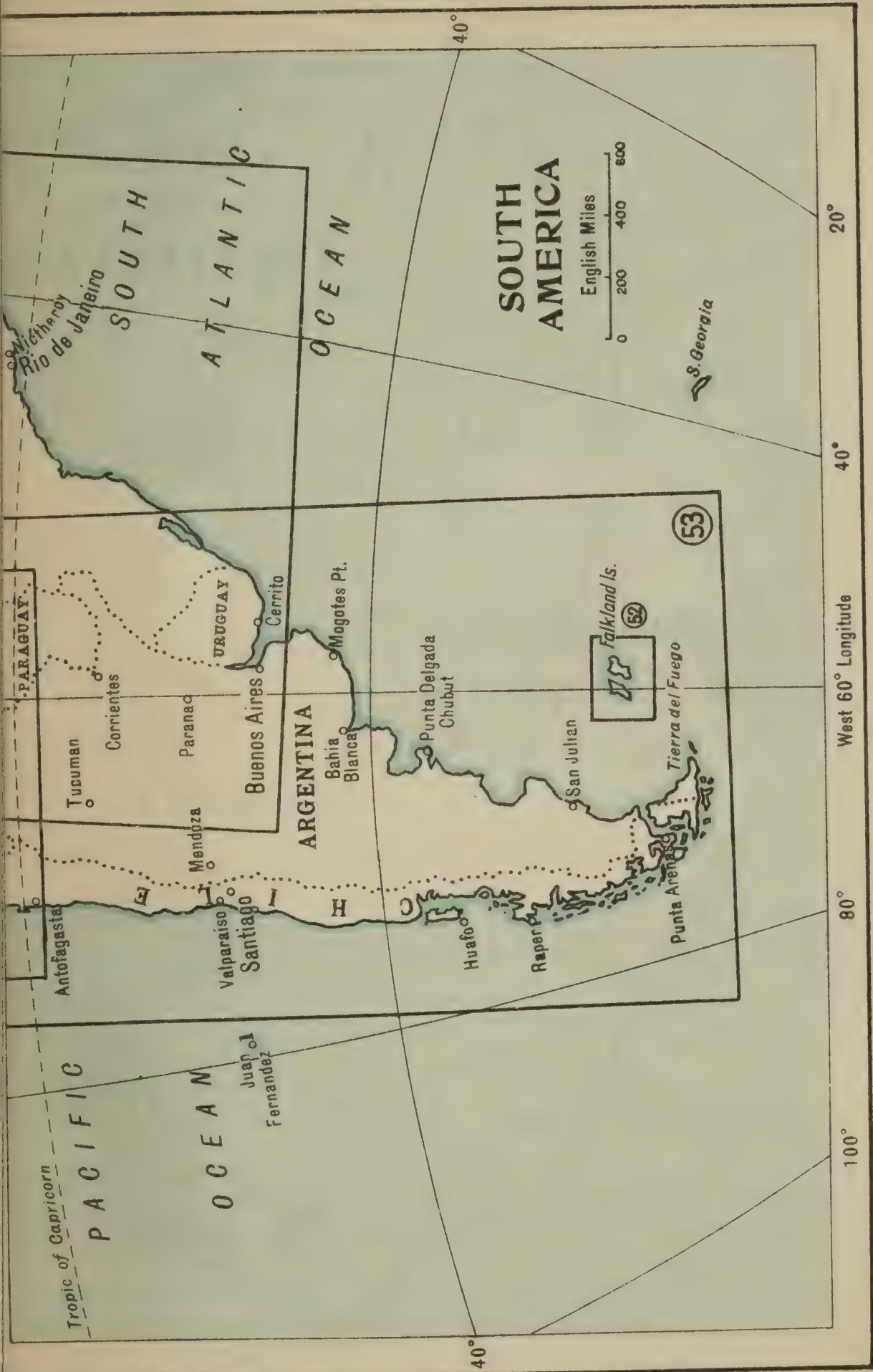


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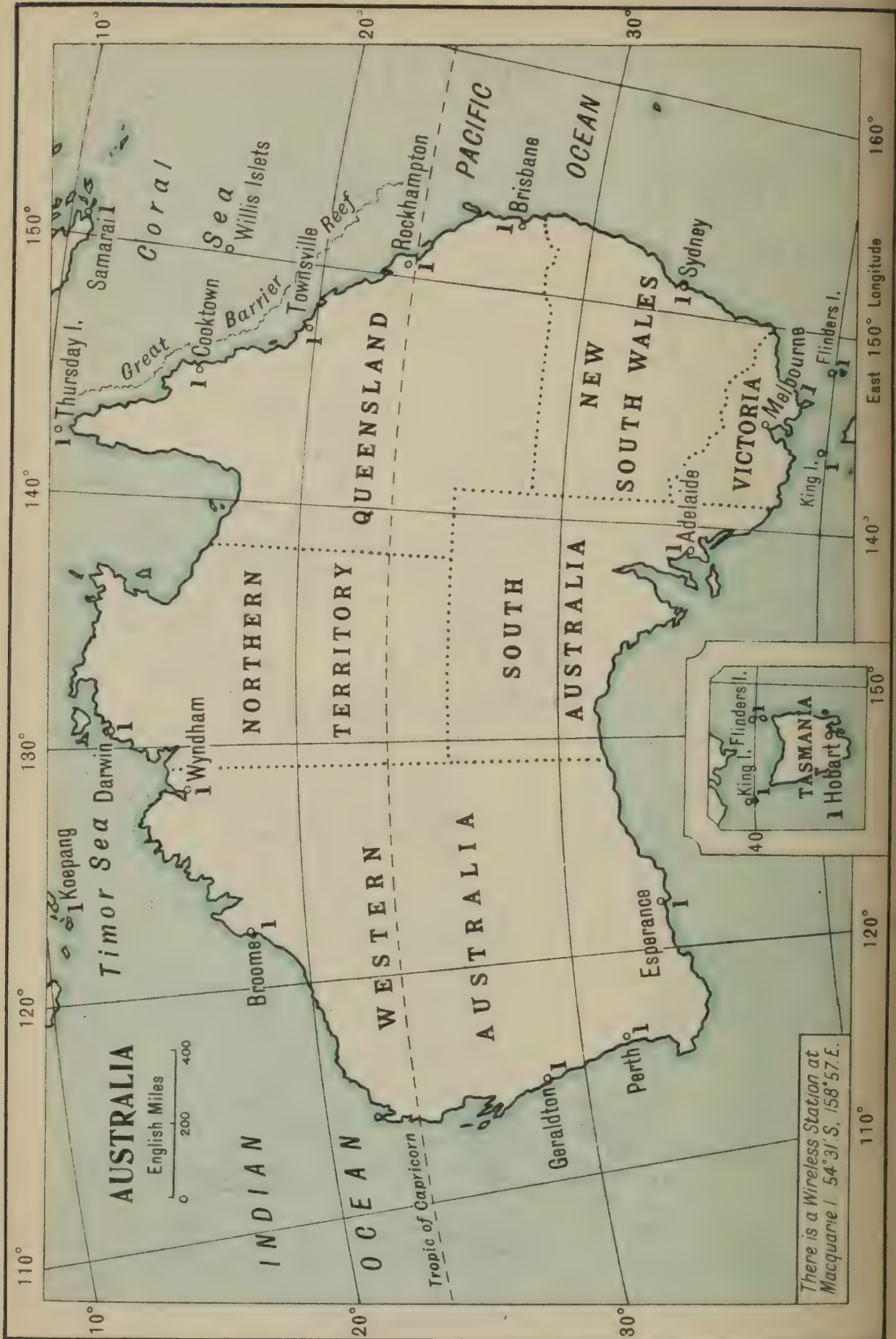
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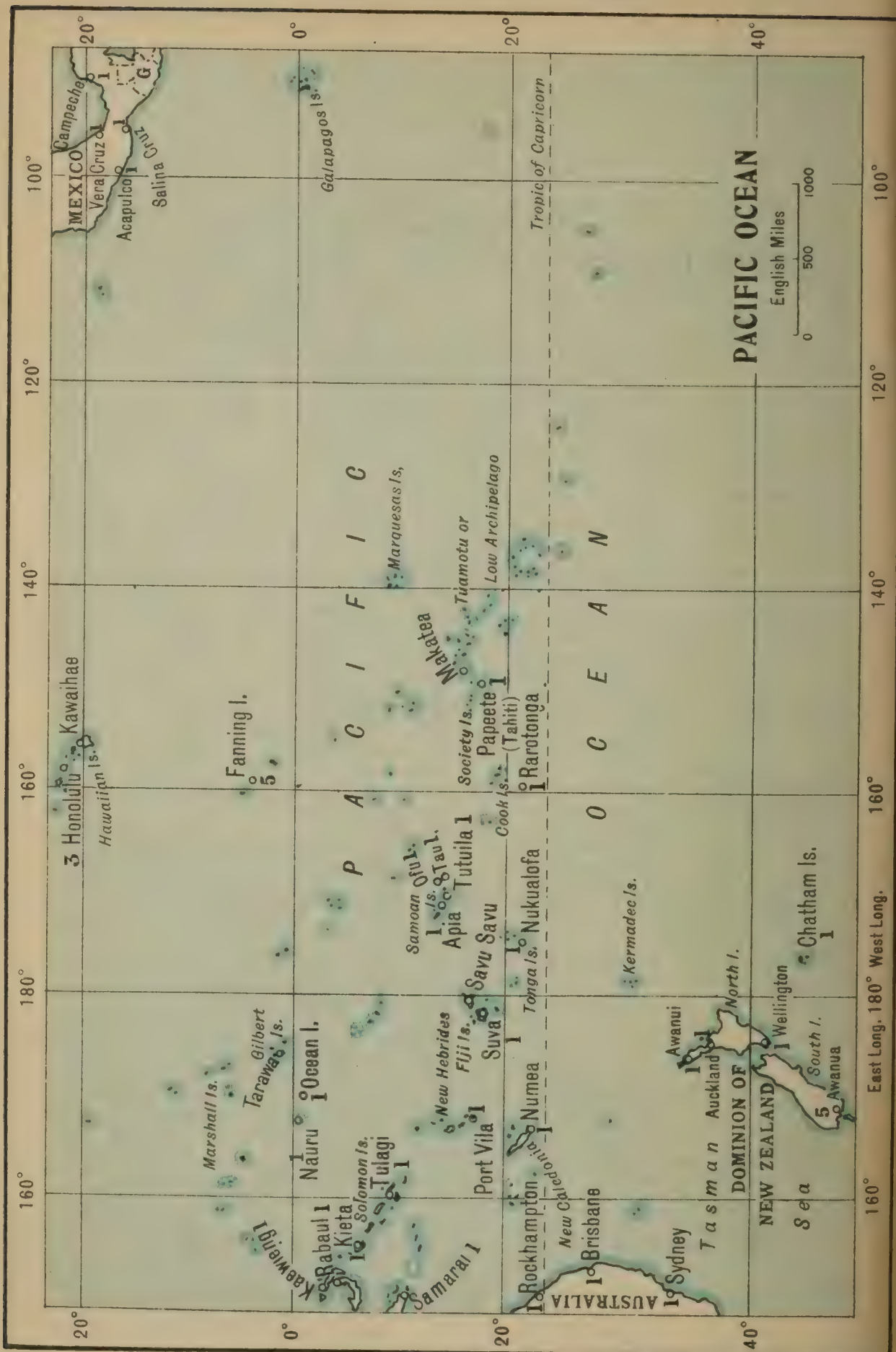
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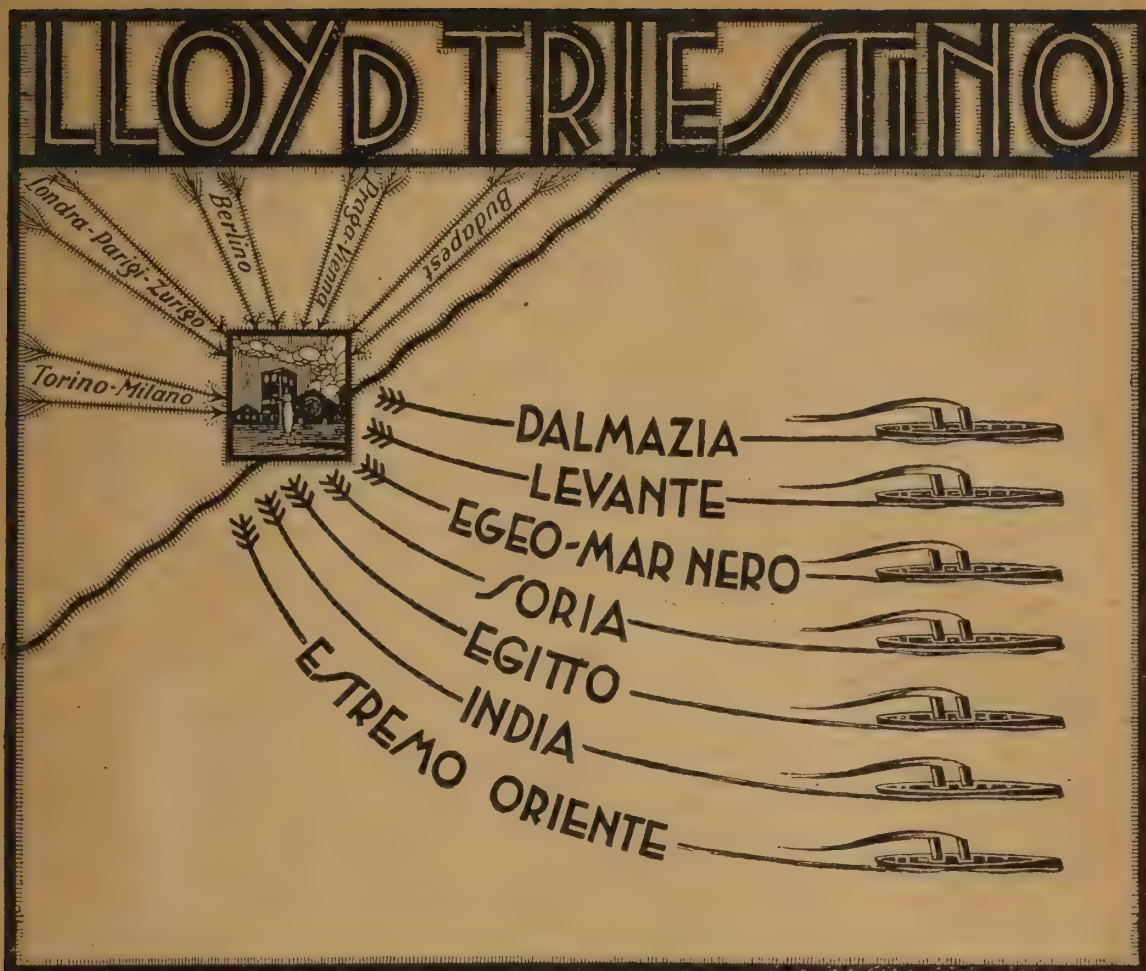
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